INDIA

RUBBER WORLD

MARCH, 1945

Newsletter No. 3
MARCH, 1945

Published by Rubber Chemicals Division of DU PONT

DU PONT ACCELERATORS AND SPECIAL CHEMICALS FOR GR-S

PROCESSING the great tonnage of GR-S will utilize all of the rubber chemicals, and particularly organic accelerators, that can be made. Many du Pont chemicals are very effective. Those that appear most interesting are listed here with a brief comment regarding their functions in GR-S.

2-MT —a medium fast accelerator for GR-S. Particularly recommended in tire and belt stocks to which it imparts high resilience and low hysteresis. Best results generally obtained when activated with Accelerator 808, Accelerator No. 8 or Vulcanex. Such combinations produce cool running tire carcass and tread stocks which have good flex crack resistance.

SRA No. 2 —versatile self-activating accelerator, useful for hot air, open steam and press cures and in stocks loaded with carbon blacks, non-black fillers and pigments.

ACRIN —a self-activated thiazole accelerator. Requires no booster in GR-S.

MBT —mild accelerator when used alone in GR-S but produces excellent vulcanizates at almost any required rate of cure by proper activation with secondary accelerators such as Thionex, Accelerator 808 or DPG, and especially Barak.

MBTS —similar to MBT but produces stocks with greater processing safety. For flat-curing vulcanizates having the best qualities, activate with Barak. Other secondary accelerations such as Thionex, Accelerator 808 or the guanidines are also recommended. For colored GR-S-50 compounds, we recommend MBTS activated with Thionex.

ZENITE —when activated with DPG, Accelerator 808, Vulcanex or Thionex, produces stocks with a fast rate of cure. Zenite-Vulcanex accelerated stocks have excellent resistance to heat aging.

ZENITE A —fast, non-scorchy accelerator for GR-S stocks; can be further activated by secondary accelerators.

ZENITE B —the outstanding single accelerator for GR-S tire stocks. Requires no activation. Widely used in camelback because of stability and long curing range imparted.

TETRONE AND TETRONE A —thiuram tetrasulfides that may be used to vulcanize GR-S without added sulfur. Produce stocks having excellent resistance to aging. When activated with Accelerator 808 or used with added sulfur, Tetrone accelerations are valuable for CV cured wire compounds, boot and shoe stocks and articles which are cured at low temperatures.

THIONEX —the preferred general-purpose accelerator for GR-S. Thionex imparts to GR-S the unique combination of extreme processing stability, very fast rate of cure at temperatures of 274° F. or above and a long flat curing range. The use of a relatively high ratio of Thionex to sulfur or activation with Accelerator 808 results in vulcanizates having non-persistent characteristics and excellent resistance to heat embrittlement.

ACCELERATOR 808 —a mild accelerator when used alone and a powerful activator for 2-MT, Thionex, Tetrone, thiazoles and Zenite.

VULCANEX —activates cure of primary accelerators such as Zenites, Thionex and 2-MT and due to non-persistency results in vulcanizates having improved stability under heat aging service.

ACCELERATOR No. 8 — (formaldehyde-para-toluidine), an excellent secondary accelerator. Use of 1 to 2 parts as activator with a thiuram or thiazole results in non-persistent acceleration.

BARAK —strong activator for 2-MT, MBT, MBTS and the Zenites; increases quality of vulcanizates and levels out curing range. Particularly adapted to GR-S carcass and curing bag stocks.

RETARDER W —promotes processing safety of thiazole and thiuram accelerated stocks but is a mild activator at curing temperatures of 260° F. or above. Functions in GR-S as in rubber. Believed to improve resistance to flex cracking in GR-S stocks.

RPA No. 5 —softens GR-S chemically with resultant saving in breakdown time and increase in masticating capacity. Stocks mix faster with less power consumption and at lower temperatures when RPA plasticized GR-S is used. Also provides improved calendering and extrusion characteristics.

HELIOZONE —imparts excellent sun checking resistance to GR-S products; should be used in all GR-S stocks exposed to sunlight in non-dynamic services.

COLORS —The use of dispersed colors in GR-S is increasing. Special GR-S-50 should be used with MBTS-Thionex to obtain the minimum amount of discoloration or staining of light and colored stocks. Proper blends of the following clean, light-fast colors will produce almost any desired hue, shade or tone in the visible spectrum:

- RUBBER RED PBD
- RUBBER RED 2BD
- RUBBER ORANGE FD
- RUBBER YELLOW GD
- RUBBER MONASTRAL FAST GREEN GSD
- RUBBER MONASTRAL FAST BLUE PCD
- RUBBER MONASTRAL BLUE YD
- RUBBER BLUE GD

UNICEL —imparts uniform cell structure and a higher degree of blow to GR-S sponge than other blowing agents. Less plastication of the elastomer is required to obtain satisfactory results.

Through the mill

NEOPRENE TYPES GN and GN-A are no longer supplied by the du Pont Company. However, their counterparts, Neoprene GRM and GRM-10, are available in any quantity at the Rubber Reserve Company Neoprene Plant, Louisville, Kentucky. GRM-10 contains 1% of an antioxidant-stabilizer which retards the development of excessive stickiness during storage; otherwise it is identical with GRM.

NEOPRENE PROCESSES best when used at a uniform age. The Louisville plant is now maintaining a controlled stock to permit shipments of uniform age, but to utilize this advantage, consumers should also adjust purchases so that a minimum stock is maintained at all times and consumption withdrawals made from the oldest material.

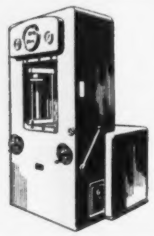
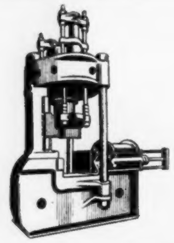
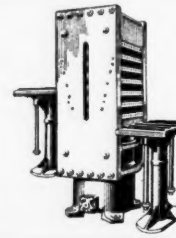
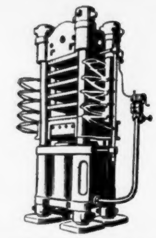
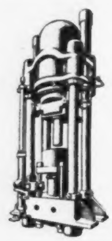
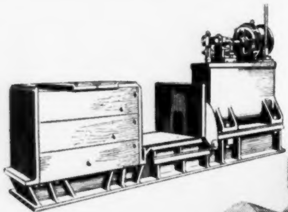
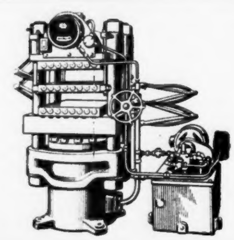
DU PONT

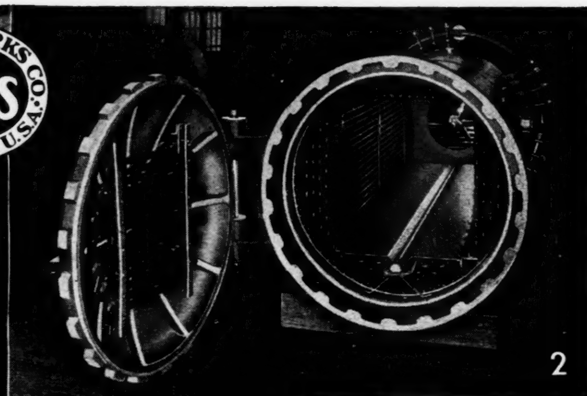
RUBBER CHEMICALS DIVISION

BETTER THINGS FOR BETTER LIVING . . . Through Chemistry

INDIA RUBBER WORLD, March, 1945, Vol. 111, No. 6. Published monthly by BILL BROTHERS PUBLISHING CORP., 386 Fourth Avenue, New York 16, N. Y., U. S. A. Entered as second-class matter December 27, 1944, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Subscription, United States and Mexico, $3.00 per year; all other countries, $4.00; single copies, 35 cents.


Hycar has done all this in the past—
It can do still more for you in the future
SHOWN here are just a few of the finished products that can be made better from Hycar synthetic rubbers. Some were routine jobs for Hycar and for the processor. Others represent hours and days of research in Hycar's Technical Service Laboratory. Each was designed to possess a certain *combination* of properties needed to do a specific job.
Hycar offers many important advantages—among them the ability to produce *a better finished article at a lower cost* despite a slightly higher initial price than some other synthetics. When true competitive markets are restored after the war, Hycar advantages will be even more important.
Hycar advantages — particularly over other oil-resistant synthetic rubbers—are shown in the following list. Consider these properties in connection with your product of the future. You will find that Hycar can fit effectively and profitably into your plans.
• *Better storage stability*
• *Dependable uniformity of crude material*
• *Lower specific gravity*
• *Better oil and gas resistance*
• *Can be blended with GR-S*
• *Will take higher pigment loadings*
• *Better extrusion characteristics*
• *A variety of combinations of properties not otherwise obtainable*
• *Excellent performance in severest types of service has been proved throughout all industry.*
Hycar's Technical Service Staff is at your service, ready to help you with your individual problems. *Hycar Chemical Company, Akron 8, Ohio.*
Hycar
Reg. U. S. Pat. Off.
LARGEST PRIVATE PRODUCER OF BUTADIENE TYPE
Synthetic Rubbers

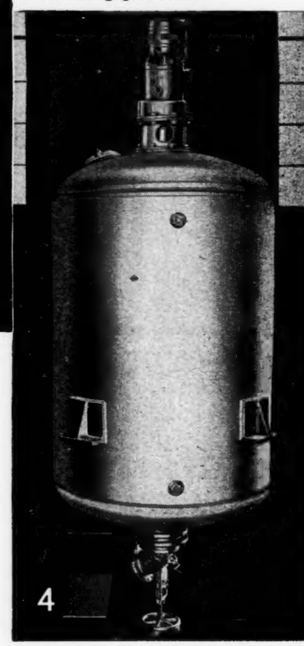










Biggs

VULCANIZERS and DEVULCANIZERS Have Served the Rubber Industry for More Than 45 Years

Fig. 1—15-ft. diameter by 45-ft. long horizontal vulcanizer with quick-opening door for vulcanizing rubber linings in large storage tanks. *Fig. 2*—Biggs vulcanizer with special heating manifolds and circulating fan; all sizes, various working pressures.

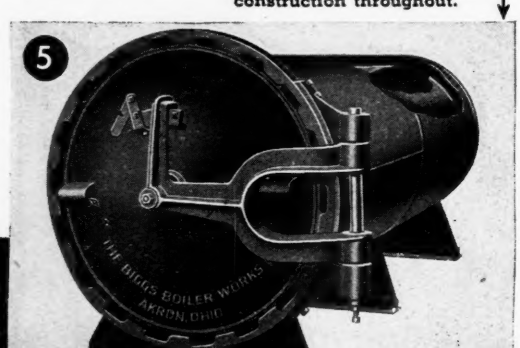


BIGGS-built vulcanizers and devulcanizers have occupied a prominent place in the development of the rubber industry since its inception. For more than 45 years Biggs has furnished single-shell and jacketed vulcanizers both vertical and horizontal, as well as many different types of devulcanizers to meet various requirements of the reclaim experts. . . . It is a far cry from the old days of bolted doors and riveted construction to Biggs modern all-welded units with quick-opening doors. Biggs vulcanizers and devulcanizers are available in all sizes and for various working pressures — with numerous special features. *Write now for our Bulletin 45.*

Fig. 3 — vertical vulcanizer with quick-opening door. Door is handled by self-contained arm and gear-operating mechanism. Hand or motor operation.

Fig. 4—high pressure heavy duty jacketed vertical devulcanizer with special agitator. Furnished in various sizes.

Fig. 5—horizontal steam-jacketed vulcanizer with hinge type quick-opening door; all sizes, for various working pressures. Welded construction throughout.



THE Biggs BOILER WORKS CO.
1007 BANK STREET, AKRON 5, OHIO, U.S.A.

HOW MUCH DO YOU KNOW about synthetic rubber scrap?

Tell us what you think is the best method of processing or using this scrap. You may win up to $500.00

FACTS ABOUT THIS BIG CONTEST

A group of rubber technologists identified with the rubber industry, known as the Chicago Rubber Group, is offering three prizes, totaling $1000.00 for the best papers on the utilization (reclaiming and processing) of cured synthetic rubber scrap. While the papers may deal with any phase of the problem, here are some subjects which suggest themselves. 1. Separation and segregation of synthetic scrap rubber. 2. Methods of identification of synthetic scrap rubber. 3. Reclaiming of synthetic scrap rubber. 4. Compounding studies which will result in greater use of reclaimed synthetic scrap, or of ground synthetic scrap rubber.
First prize: $500.00; second prize: $300.00; third prize: $200.00. If you feel that you have ideas of value for this contest, be sure to enter! You may win one of these substantial cash prizes.

READ THESE SIMPLE CONTEST RULES:

This contest is open to anyone in the United States or Canada excepting officers and directors of the Chicago Rubber Group for 1943-45. Selection of subject matter is left to the discretion of the contestant. As many papers as desired may be submitted by any one contestant. Papers should be based upon information which has not previously been presented before any technical society meeting or published in any trade magazine. Contest closes at midnight on August 1, 1945. Awards will be made during the fall meeting of the American Chemical Society in Chicago, 1945. The decision of the judges will be final. Each author must submit three copies of his paper to Mr. A. R. Floreen, Vice President, City National Bank & Trust Company, 208 S. La Salle Street, Chicago. These three copies will be judged separately by the Rubber Manufacturers Association, the Rubber Reclaimers Association and the Rubber Division of the American Chemical Society. The judges will report their findings to Bruce W. Hubbard, Chairman, Chicago Rubber Group, 2512 W. 24th Street, Chicago, to whom all inquiries for additional information should be addressed.

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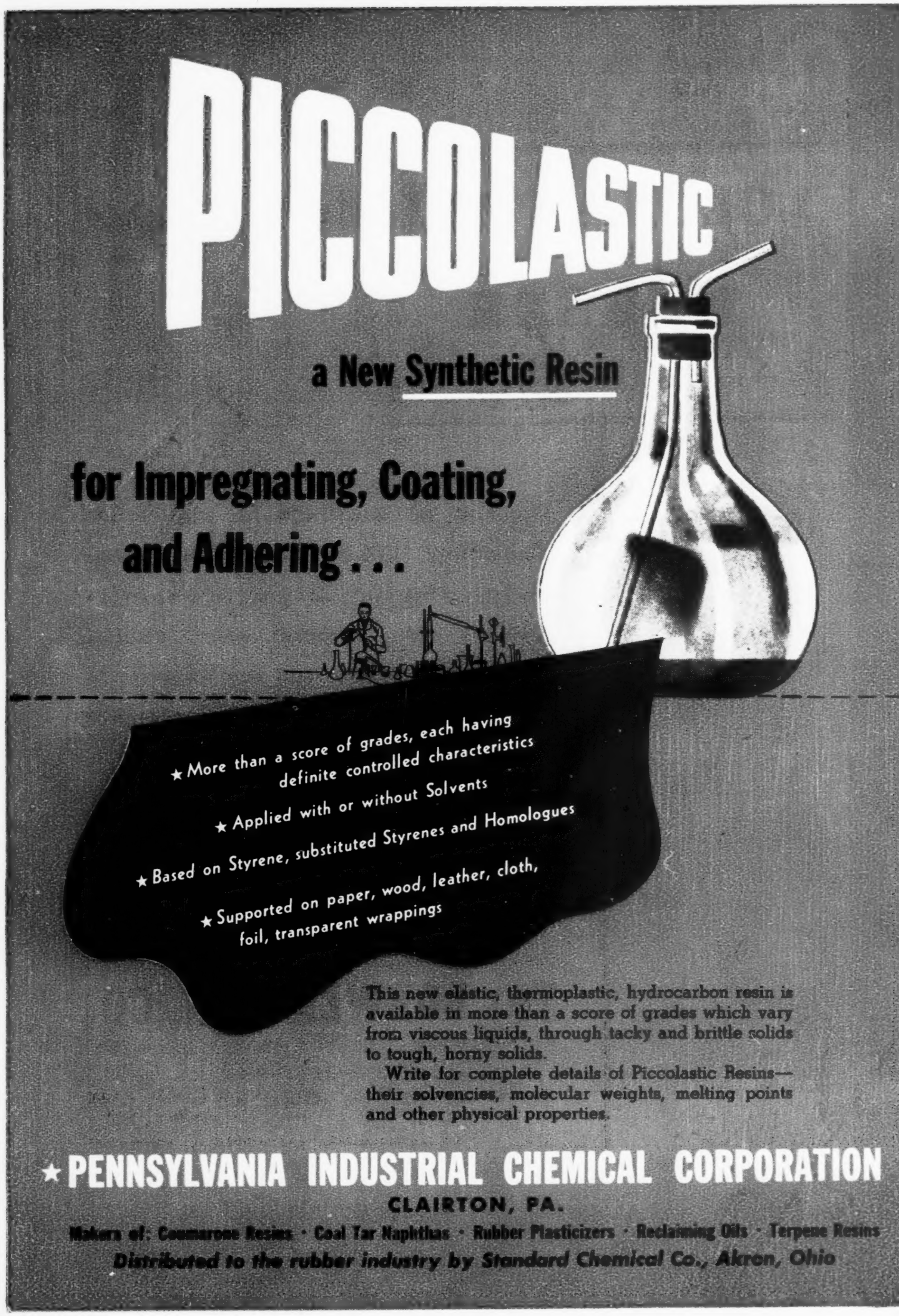
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a New Synthetic Resin
for Impregnating, Coating, and Adhering . . .
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This new elastic, thermoplastic, hydrocarbon resin is available in more than a score of grades which vary from viscous liquids, through tacky and brittle solids to tough, horny solids.
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PLASTICIZERS AND MODIFIERS

TO HELP THE RUBBER MANUFACTURER

In the extensive line of plasticizers and modifiers developed by The Resinous Products & Chemical Company, the rubber compounder will find aid in solving many of the problems confronting him today. Detailed information and technical assistance in the use of these outstanding products is freely available.

	PLASTICIZER TYPE	BUNA N	NEOPRENE GN (GRM)	POLYVINYL CHLORIDE	POLYVINYL BUTYRAL
ESTER OR MONOMERIC TYPES	DIBUTYL SEBACATE	High resilience and outstanding low-temperature flexibility. Excellent drape.	Outstanding low-temperature flexibility. Widely used in both rubber and latex.	Unexcelled for low-temperature flexibility, plasticizing efficiency, resilience and drape in PVC and copolymers. Excellent color stability.	High efficiency, excellent low-temperature flexibility, color and light stability.
	DIBENZYL SEBACATE	Good resilience and low-temperature flexibility. Excellent for stocks subjected to high temperature service.		Outstanding permanence and electrical properties, when used as secondary plasticizer. Low flammability.	
	DIOCTYL SEBACATE			High plasticizing efficiency and extreme low-temperature flexibility combined with permanence at higher temperatures. Excellent dielectric properties.	
	DICAPRYL PHTHALATE	Good plasticizing efficiency. For use in soft stocks.	Permanence, resilience and lasting low-temperature flexibility. Particularly useful for molded goods.	Efficiency, satisfactory low-temperature flexibility and excellent permanence at very low cost.	
	PLASTICIZER 35			Highly efficient, low-cost secondary plasticizer.	Extreme efficiency, excellent permanence and good low-temperature flexibility. Good low-cost, general purpose plasticizer in coated goods.
	PLASTICIZER 36			High efficiency, extreme low-temperature flexibility, low cost, excellent drape.	High efficiency, permanence and good low-temperature flexibility.
POLYESTER OR POLYMERIC TYPES	PARAPLEX G-25	Outstanding for permanence and resistance to extraction by hot oils. Good low-temperature flexibility.		Unexcelled for permanence and resistance to extraction and migration. Superior resistance to weathering, especially ultra violet.	
	PARAPLEX AL-111	Permanence, excellent heat and oil resistance. A low-cost, non-migrating plasticizer.	Permanence, reasonable low-temperature flexibility. Low-cost processing aid, particularly for milling, molding and extruding.		
	PARAPLEX RG-8				Permanence and high efficiency. Low-cost resinous type, well suited to formulation of adhesives for combining, etc. — because of desirable tack.
	SPECIAL TYPES	Resin R6-3 is outstanding for permanence and resistance to hot oils.			AMBEROL ST-137, UFORMITE MM-55 and AMBERLITE PR-14 all well suited for thermosetting of PVB compositions, both calender and solvent types.

PARAPLEX, AMBEROL, UFORMITE and AMBERLITE *are trade-marks, Reg. U. S. Pat. Off.*

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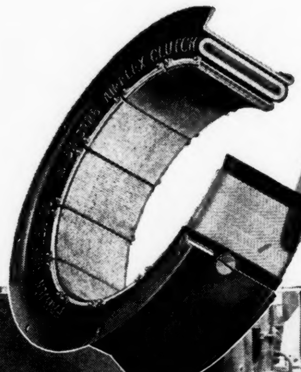
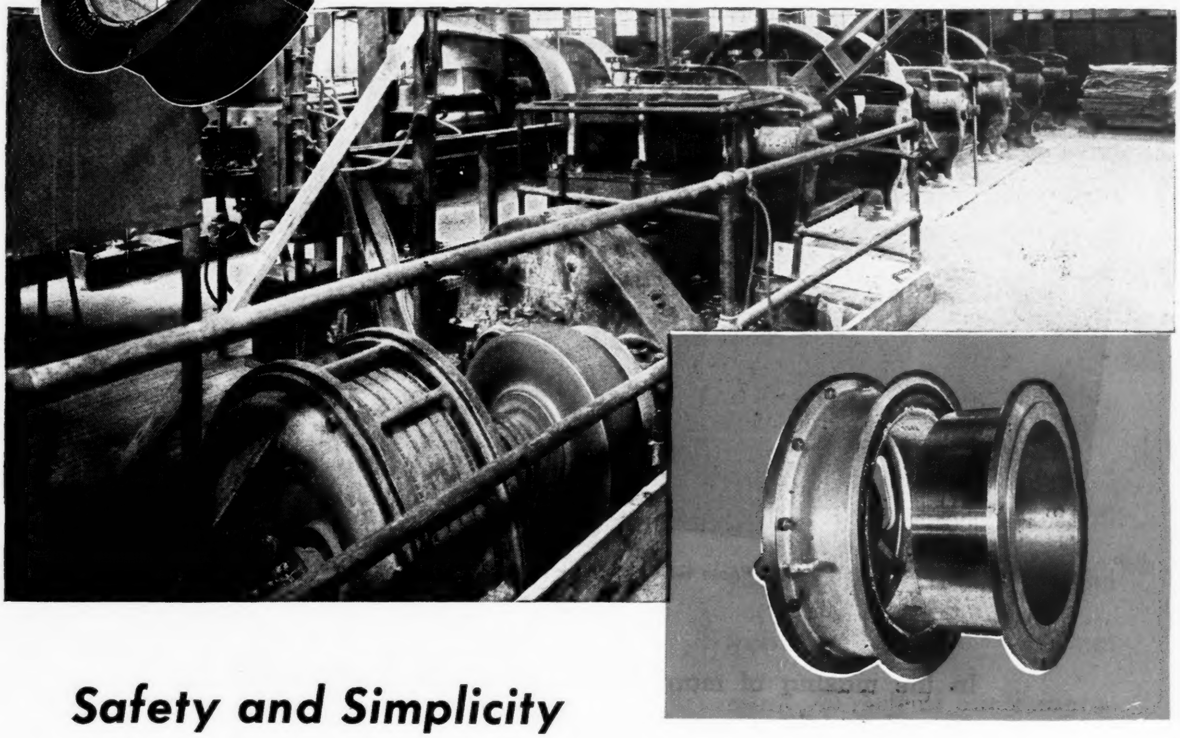

AIRFLEX CLUTCH



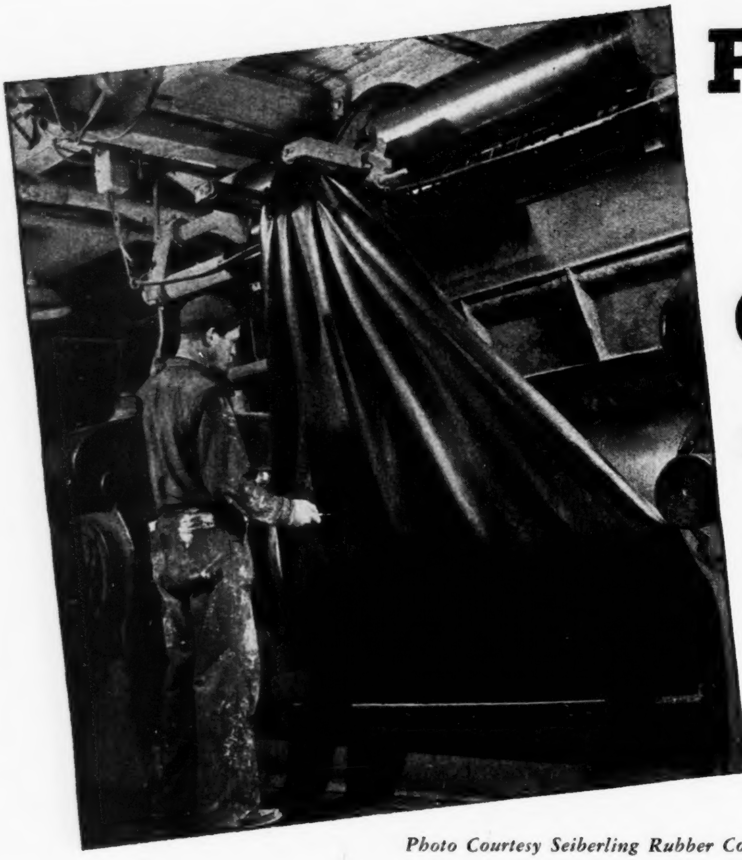


Photo Courtesy Seiberling Rubber Co.

PELLETEX and GASTEX

Help "Kneading" of Synthetics

In the making of many synthetic rubber products, the operations take longer and require more care than in the case of natural rubber.

GASTEX or PELLETEX in the compound makes the material more plastic and easier to handle.

Put these long-established, leading semi-reinforcing furnace blacks to work for you. Our engineering staff is at your service for present and post-war production.

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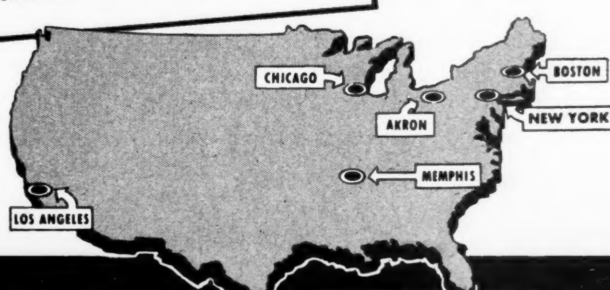

CHICAGO
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LOS ANGELES

THE SHADOW WILL PASS...

THE SHADOW cast by war on white rubber goods will pass . . . and it is reassuring to know that TITANOX pigments then will be ready to play their all-important part in the brighter picture of the future.

TITANOX pigmented white side-wall tires again will grace the nation's motor cars, continuing their demonstration of ability to stand up under severe usage . . . sparkling white rubber goods again will provide eye-appeal for the buying public.

Against that day, conscious of its obligation to the industry, the efforts of the Rubber Service Staff at the TITANOX Laboratories are, as always, dedicated to improvement in the technique of white rubber compounding.

For the present may we reiterate: In GR-S as in natural rubber TITANOX pigments provide the greatest possible whitening effect.

We invite technical inquiry

TITANOX REG. U. S. PAT. OFF.

TITANOX

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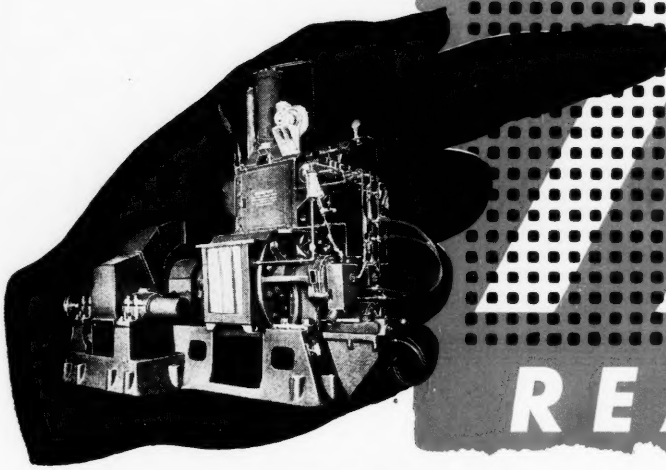


775 REASONS

why Farrel-Birmingham should handle your Banbury Repairs

FARREL-BIRMINGHAM

...is the only company having drawings showing the original dimensions of every part of the Banbury.

...is the only company having complete jigs, fixtures and gauges necessary for satisfactory repairs.

. . . as the developer and manufacturer of the Banbury Mixer, is the company that can best determine what is required to restore a Banbury to its original work capacity.

A *Banbury Mixer is composed of 775 different parts.*

Farrel-Birmingham has specifications covering every one of these parts.

242 of the pieces have to be machined, calling for a total of 882 operations to finish.

Farrel-Birmingham has drawings showing the finished dimensions of every one of these parts, as well as each of the 882 necessary machining operations.

When any one of the 775 parts of a Banbury in service becomes broken, a Farrel-Birmingham engineer can look at a drawing and specify a replacement in a matter of minutes.

When a part—such as a rotor, a door top, or the inside of the chamber body, for example—becomes worn, blueprints show the Farrel-Birmingham engineer just how much rebuilding is required to return the part to its original size, contour and work efficiency. There is no guessing—everything is down in blue and white.

Farrel-Birmingham is set up to handle all necessary Banbury repairs. For quick service—write, wire or phone.

FARREL-BIRMINGHAM COMPANY, INC.

ANSONIA, CONN. (Telephone Ansonia 3600)

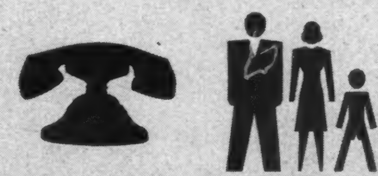
Akron, Ohio: 2710 First Central Tower (Tel. Jefferson 3149)

Farrel-Birmingham

A MODERN SYLLOGISM

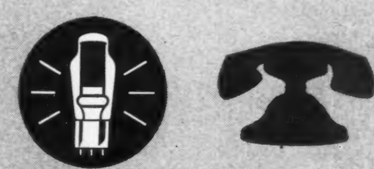
MAJOR PREMISE:

Bell Telephone System serves the American Public.



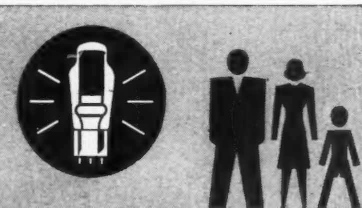
MINOR PREMISE:

Bell Telephone Laboratories develop the facilities of the Bell System.



CONCLUSION:

Therefore, Bell Laboratories serve the American Public.



And that is the *raison d'être* of the Laboratories. For the Bell Telephone System, the Laboratories carry on research studies in all the sciences and development work in all the engineering arts that relate to electrical communication.

For the Western Electric Company, the manufacturing unit of the System, the Laboratories develop equipment, prepare specifications for its construction, and engage in various engineering activities.

For the Armed Forces of the United States, under contracts of the Western Electric, the Laboratories have undertaken more than a thousand development projects — many with spectacular effect upon our enemies.

BELL TELEPHONE LABORATORIES ***explore and invent, devise and perfect for our Armed Forces at war and for continued improvements and economies in telephone service.***

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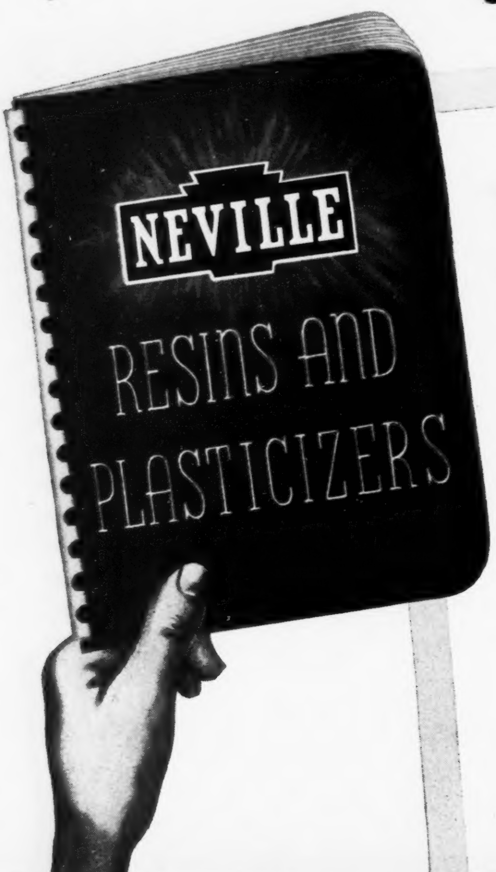

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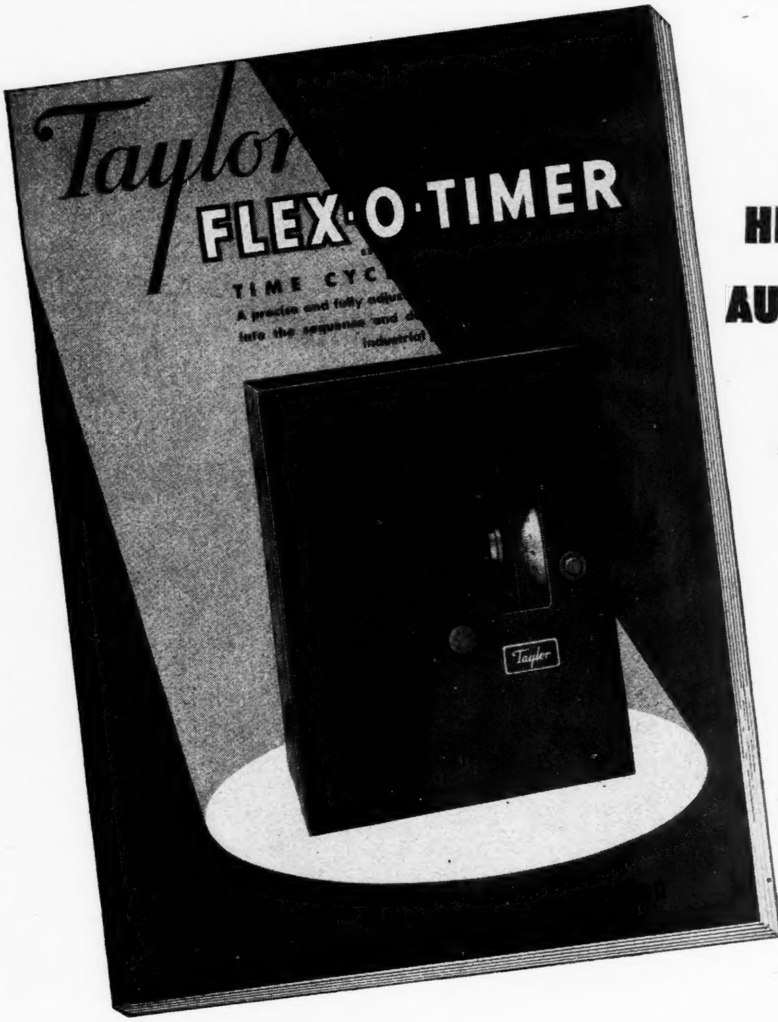

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Technical Bulletin No. 8 on the Compounding of GR-S with Substantial Loadings of Zinc Oxide

Butyraldehyde Aniline—MBT Acceleration

IN THIS CASE the primary accelerator is of the basic type, activated with a small amount of acidic MBT. This compound produces moderate tensiles which hold well on aging, with good retention of elongation and little inclination toward "marching modulus." While the Pendulum Rebound is lower than some of the compounds previously reported, the Temperature Rise on flexing is very satisfactory.

COMPOUND NO. 8

GR-S	100.0
Sulfur	3.5
Butyraldehyde Aniline	1.0
MBT	0.15
ELC Magnesia	5.0
Coumarone-indene resin	7.5
Zinc Oxide	100.0

ORIGINAL RESULTS

Time of Cure Min. at 45 Lb.	Tensile Strength Lb./Sq. In.	Per Cent Elongation	Load (Lb./Sq. In.) For Elongation of					Permanent Set
			100%	200%	300%	400%	500%	
7.5	1270	770	---	120	200	275	435	.33
15	1160	595	---	200	320	480	760	.25
30	1090	505	---	240	360	605	1050	.21
45	1020	475	---	245	365	655	---	.17
60	1130	450	---	240	445	725	---	.17
90	960	430	---	280	480	840	---	.12
AFTER 24-HOURS GEER OVEN AGING AT 100° C.								
7.5	1030	585	125	250	330	455	700	.29
15	1250	520	160	285	405	645	1130	.31
30	1135	445	210	335	460	840	---	.25
45	1080	440	210	330	455	875	---	.22
60	1070	430	205	330	495	905	---	.19
90	1070	400	250	370	620	1070	---	.17

ORIGINAL RESULTS

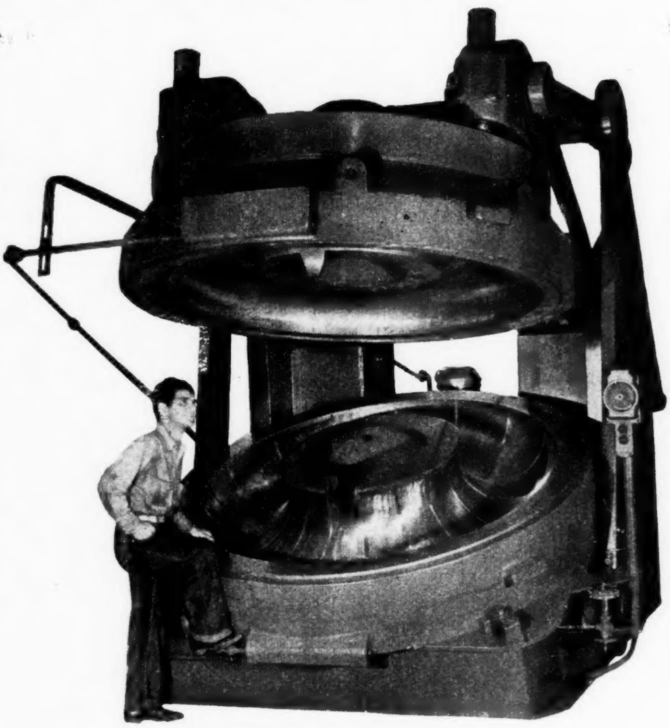
Time of Cure Min. at 45 Lb.	Shore Hardness	Goodyear-Healey Pendulum		Compression Fatigue (Goodrich Flexometer)*					Cut-Growth Resistance Inches—Failure at	
							Dynamic Compression			
		Indentation in mm.	Per Cent Rebound	Per Cent Initial Comp.	Running Time and Per Cent Permanent Set	Max. Temp. Rise °C.	Initial	Final	9,000 Cyc.	20,000 Cyc.
45	47	8.06	58.6	21.6	15′—6.4	16.2	13.6	17.3	.23	.40
60	50	7.96	59.6	19.8	15′—4.5	14.9	11.8	14.0	—	—

*Test Conditions: 100 Lb. Load. 0.15″ Stroke. 100°C. Oven Temp.


S.P.

DADDY OF THEM ALL—

Largest McNeil-Akron Individual Inner Tube Vulcanizing Unit Ever Built



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MODEL 110—45″—14

Our most popular tube press is this small unit, which is only 45″ wide between the side frames. It is suitable for the full range of passenger sizes as well as all truck tubes up to and including 11.00 x 20. Maximum cavity size 9″ cross section x 40″ O. D.

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This Giant Vulcanizer complete with mold weighs approximately 37,000 lbs. and is good for 500,000 lbs. total internal pressure, or up to 125 lbs. per sq. in. in a maximum cavity. This press is 85″ wide between the side arms and will accommodate a mold cavity size up to 22″ in cross section x 76″ outside diameter. The mold shown is for 24.00 x 32 inner tubes such as are used on Giant Earth Mover equipment. Upper mold support platen is adjusted electrically to suit various mold thicknesses. This feature simplifies and speeds up mold changing.

In addition to the 45″ and 85″ sizes illustrated here, we make intermediate sizes, which are 55″ and 75″ respectively between the side frames. All presses of course are designed to take existing molds and provisions have been made to speed mold changing as much as possible

WRITE FOR DETAILS ON BOTH

THE McNEIL MACHINE & ENGINEERING CO.

96 EAST CROSIER ST. AKRON 11, OHIO

March, 1945

Volume 111 Number 6

A Bill Brothers Publication

INDIA
RUBBER WORLD
NATURAL & SYNTHETIC

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Published monthly by Bill Brothers Publishing Corp., 386 Fourth Ave., New York 16, N. Y. Chairman of Board and Treasurer, Raymond Bill; President and General Manager, Edward Lyman Bill; Vice Presidents, Randolph Brown, B. Brittain Wilson.

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Subscription price—United States and Mexico, $3.00 per year; all other countries, $4.00. Single copies, thirty-five cents. Other Bill publications are: GROCER-GRAPHIC, PREMIUM PRACTICE, RUG PROFITS, Soda FOUNTAIN SERVICE, TIRES Service Station, Sales Management.

INDIA

RUBBER WORLD

NATURAL & SYNTHETIC

Published at 386 Fourth Avenue, New York 16, N. Y.

Volume 111 **New York, March, 1945** **Number 6**

Reclaimed Synthetic Rubber

F. L. Kilbourne[1]

THE purpose of this article is to bring to the attention of rubber technologists the progress which has been made in reclaiming synthetic rubber and to point out in a general way some of the problems that may be faced by the rubber compounder in the future should natural rubber reclaim become scarce and reclaimed synthetic rubber be the only product that is available.

The problem of reclaiming synthetic rubber has been recognized in this laboratory, as in other reclaimers' laboratories, ever since the advent of neoprene as a commercial synthetic rubber in 1931. Reclaimed neoprene has been processed and sold to the public at large since 1938. The replacement of natural rubber by synthetic rubber since December 7, 1941, has greatly emphasized the necessity of reclaiming synthetic rubber. From that day to the present, reclaimers have worked diligently on methods for reclaiming the several synthetic rubbers which have been made available, naturally with most emphasis on the GR-S type.

The amount of synthetic rubber reclaim that has been made and used up to the present time is small relative to the total production of reclaimed rubber. The reclaimed rubber industry, except for research activities on synthetic rubber reclaiming, has devoted itself to the production of the maximum quantity of natural rubber reclaim in order to extend the nation's dwindling supply of crude. The industry became aware early in the war that its product would be invaluable in extending the crude rubber stockpile while the synthetic rubber industry was developing. The fact that the United States did not exhaust its supply of crude during 1942, 1943, and 1944 is in no small measure a result of the efforts of the reclaiming industry to produce every possible pound of reclaim. This contribution to the war effort is still continuing. Having come to the rescue when the natural rubber stockpile was rapidly dwindling and again when the GR-S program was in its infancy, reclaimed rubber may again be called upon to help offset shortages of certain types of carbon black.

In the present paper data illustrating the uses of GR-S tire, tube, and mechanical reclaims as well as those made from neoprene, Buna N, and Butyl scraps will be presented briefly.

Chemical Properties of Synthetic Reclaims

The analyses of typical synthetic reclaims are reported in Table 1. This table shows also a natural rubber whole-tire reclaim which has been reenforced with 5% of channel black. Compounders who are familiar with the use of reclaimed rubber will agree that there is no important difference between the analysis of the GR-S reclaims and the natural rubber reclaim. Acetone extracts are somewhat higher in the GR-S reclaims because of a higher softener content in the GR-S scrap and also because of the use of either higher proportions or more permanent oils in the reclaiming process. Ash contents are generally lower because the original GR-S was reenforced mainly by carbon black. Carbon black contents are therefore higher than those of corresponding natural rubber reclaims. The net effect on the rubber content is a lower figure for the synthetic reclaims than is customary in natural rubber reclaims. The compounder is primarily interested in reclaimed rubber because it enables him to lower costs, to extend his supply of natural or synthetic rubber, to speed up processing, or to secure flatter compounds; therefore, exact duplication of natural rubber reclaim analysis is not essential. Obviously the compounder wants the highest possible rubber content in his reclaim provided that the reclaim has a plasticity close to that to which he is accustomed.

[1] Chief chemist, Xylos Rubber Co., Akron, O.

TABLE 1. TYPICAL ANALYSIS—SYNTHETIC RECLAIMS

Type	A Natural Rubber Whole Tire (+ Added Black)	B GR-S Whole Tire	C GR-S Tube	D GR-S Red Mechanical	E Neoprene Mechanical	F Buna N Mechanical	G Butyl Tube
Acetone extract	10.52	18.16	16.95	24.9	32.10	11.40	3.27
Ash	13.13	8.00	12.95	32.9	10.40	12.95	8.25
Cured chloroform extract	.98	2.52	1.50	.8	1.89	1.20	2.41
Carbon black	20.49	17.70	19.55	—	13.45	28.30	30.7
Cellulose	1.15	3.50	nil	—	6.65	—	—
Total sulphur	1.70	1.81	1.33	1.5	1.19	1.38	1.3
Rubber content	52.03	48.31	47.72	39.9	34.32	44.77	54.07
Alkalinity	.20	nil	nil	nil	nil	nil	nil
Specific gravity	1.16	1.16	1.19	1.31	1.30	1.28	1.15
Test formula	I	I	I	—	II	III	IV
Cure	20' @ 287° F.	20' @ 312° F.	20' @ 312° F.	—	30' @ 312° F.	20' @ 307° F.	30' @ 312° F.
Stress @ 300%	995	535	410	—	665	—	420
Elongation, %	320	450	455	—	360	210	595
Tensile, p.s.i.	1140	1050	830	—	700	830	1500
Shore hardness	57	48	46	—	70	68	40

TABLE 2. TEST FORMULAE FOR SYNTHETIC RECLAIMS

Formula for	I Rubber Reclaimers Test Formula	II Neoprene	III Buna N	IV Butyl	V GR-S	VI GR-S
Reclaim	200	200	200	200	200	200
Zinc oxide	5	20	3.2	6	5	4
Stearic Acid	2	—	.54	—	2	1
Light calcined Magnesia	—	20	—	—	—	—
Sulphur	3	10	2.66	2.50	3	5
2-mercapto-benzothiazole	0.5	—	.54	1.20	—	—
Diphenylguanidine	0.2	—	.54	—	—	—
Tetramethyl thiuram disulphide	—	—	—	1.20	—	—
Ethyl selenac	—	—	—	1.20	—	—
N-cyclohexyl-2-benzothiazole sulphenamide	—	—	—	—	1.5	1.5

TABLE 3. RESULTS WITH TEST FORMULAE FOR GR-S WHOLE-TIRE RECLAIMS

Cure	Stress @ 300%	% Elongation	Tensile P.S.I.	Shore Hardness
Natural Rubber Reclaim—A Test Formula 1				
Min. @ 287° F.				
7½	600	385	830	48
15	700	385	990	50
30	820	350	1080*	53
45	830	355	1030	54
GR-S Whole Tire Reclaim—B Test Formula 1				
Min. @ 287° F.				
30	495	415	865	43
45	555	415	950	44
60	640	405	1055	48
75	680	395	1090*	50
90	650	410	1060	49
GR-S Whole Tire Reclaim—B Test Formula 1				
Min. @ 312° F.				
10	420	470	935	48
15	540	450	1010	49
20	535	450	1050*	48
25	510	440	1000	50
GR-S Whole Tire Reclaim—B Test Formula V				
Min. @ 287° F.				
30	580	395	940	44
45	680	370	950	48
60	655	400	1050	48
75	800	345	1035*	51
GR-S Whole Tire Reclaim—B Test Formula VI				
Min. @ 287° F.				
15	405	460	775	42
30	890	320	1030	49
45	1080	315	1180	54
60	1230	300	1230*	55

* Optimum cure.

TABLE 4. GR-S CARCASS COMPOUNDS "C" QUALITY

Formula	VII	VIII	IX
GR-S	100	85	85
Alkali natural rubber reclaim A		28.60	
Neutral GR-S reclaim B			30.80
Semi-reenforcing black	35.50	30.00	30.00
Zinc oxide	5.00	5.00	5.00
Stearic acid	1.00	1.00	1.00
Pine tar	5.00	5.00	5.00
Bardol	5.00	5.00	5.00
Barak	1.00	1.00	1.00
N-cyclohexyl-2-benzothiazole sulphenamide	1.25	1.25	1.25
Sulphur	1.80	2.30	2.30

					Aged 70 Hours*		Aged 96 Hours†				
Cure @ 270° F.	Stress @ 300%	% Elongation	Tensile P.S.I.	Shore Hardness	% Elongation	Tensile P.S.I.	% Elongation	Tensile P.S.I.	Running Temperature 55-Minute Cure after One Hour‡ ° F.	Rebound @ 75° F. 55-Minute Cure %	Rebound @ 212° F. 55-Minute Cure %
Formula VII—GR-S Carcass—No Reclaim											
30	240	795	1200	46	260	825	530	1070			
45	390	595	1160	49	265	855	485	1150	196	46	60
60	415	555	1115	52	260	810	440	1000			
Formula VIII—GR-S Carcass—Alkali Natural Rubber Reclaim											
30	475	545	1100	52	250	790	400	1050			
45	585	490	1160	55	240	810	355	970	195	45	60
60	600	445	1040	55	245	760	355	1020			
Formula IX—GR-S Carcass—GR-S Reclaim											
30	320	715	1310	50	245	875	585	1190			
45	475	555	1235	53	255	915	500	1145	198	43	60
60	515	535	1250	54	255	850	445	1075			

* 70 hours at 212° F. in air.
† 96 hours at 158° F.—300 lbs. sq. in. in oxygen.
‡ Firestone flexometer—250 lbs. load—0.3-inch throw.

In the case of the neoprene reclaim a much higher acetone extract is present than ordinarily present in reclaimed rubber. Experience has shown that high concentrations of plasticizers are necessary in the reclaiming of neoprene.[2] Neoprene has the property of tolerating a much higher percentage of oils than natural rubber or GR-S. The principal objection to high acetone extract in a neoprene reclaim is that it cuts down the percentage of reclaimed neoprene polymer.

Tests given here for the Buna N reclaim are not necessarily typical. They were obtained by processing Buna N scrap in such a manner that no added oils were required. The product is drier and less nervy than conventional reclaims and has excellent oil resistance which justify special efforts to plasticize it and incorporate it in oil-resistant rubber compounds. Similarly, the Butyl reclaim reported here was made from Butyl tubes manufactured by a single manufacturer and for that reason cannot be considered completely typical.

GR-S Reclaim

An excellent summary of compounds in which GR-S reclaim has been used was given by Randall.[3]

Table 2 shows several all-reclaim test formulae, and Table 3 shows the tests obtained with a typical GR-S whole-tire reclaim as compared to a typical alkali tire reclaim. The GR-S whole-tire reclaim has a lower alkalinity than alkali reclaims. The reason for this is that it has been found advisable to use small percentages of chemical plasticizers in reclaiming GR-S, and most of the latter are not stable in the presence of alkali. It is necessary to remove tire cords with a dilute solution of zinc chloride instead of dilute caustic soda solutions when these chemical plasticizers are used. The result is a neutral GR-S reclaim which has a slower rate of cure, as shown in Table 3. In GR-S reclaim the lower alkalinity decreases the "scorching" tendency, but it also has the disadvantage that it may require lengthening of the cure or raising the curing temperature. Higher concentrations of sulphur may also be used to secure higher tensile strengths at shorter cures. Obviously reclaimers should try to produce alkali GR-S reclaims comparable in rate of cure to standard natural rubber reclaims.

Table 4 gives physical tests obtained when alkali natural rubber reclaim and neutral GR-S reclaim were substituted in a typical GR-S "C" quality carcass compound. Here the percentage of reclaim used is apparently not sufficient to retard the rate of cure of the compound. It is interesting to note that the compound containing GR-S reclaim has a higher tensile strength than the GR-S control, and the elongation figures are fairly close to those of the control. The alkali reclaim compound is harder and has lower tensiles and elongations. This point is especially true after oven or oxygen bomb aging. There was practically no difference in running temperatures of the three compounds.

As an illustration of the decrease in "nerve" characterized by synthetic rubber whole-tire reclaim, photographs have been taken of tubes produced with a laboratory tubing machine, using in one case the standard natural rubber whole-tire reclaim A and in the

[2] U. S. patent No. 2,324,980 (July 20, 1943); D. F. Fraser, INDIA RUBBER WORLD, 105, 2, 150 (1941).
[3] *Rubber Age*, 56, 1, 65 (1944).

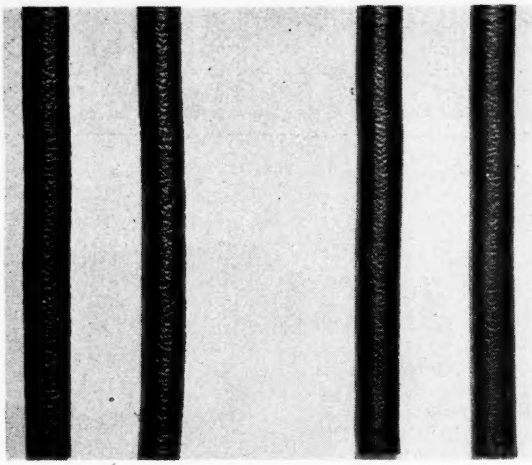

Fig. 1. Samples of Natural (Left) and Synthetic (Right) Whole Tire Reclaim Produced with Laboratory Tubing Machine

other case the standard GR-S whole tire reclaim B. The photograph, Figure 1, shows clearly the smoother tubing properties of the GR-S reclaim. Reports from compounders who have used synthetic reclaim in GR-S tread compounds confirm this superior tubing property imparted by the GR-S whole-tire reclaim.

In molded goods such as heels GR-S reclaim may be substituted for natural rubber reclaim with little change in physical properties provided that increased sulphur is used in the GR-S reclaim recipe. This is illustrated in Table 5.

A series of hard rubber compounds is shown in Table 6. This series shows the effect of increasing sulphur concentration from approximately 31 parts per 100 of hydrocarbon to 46.5. The higher concentration of sulphur appears to be essential to secure sufficiently low elongation to approach that of the natural rubber reclaim control compound. Furthermore the natural rubber compound required curing for only 25 minutes at 338° F., while the GR-S compounds required 35 minutes at the same temperature. During the preparation of these compounds it was noticed those containing GR-S reclaim exhibited less tack than those containing natural rubber reclaim. They mixed easily on the front roll on the laboratory mill; whereas the natural rubber compound had a tendency to go to the back roll. Pigments were easily incorporated in the GR-S reclaim in spite of the lower degree of tack.

Results of the loading test are given in Table 7. This test has been described by H. F. Palmer.[4] It is carried out on a laboratory mill by placing 500 grams of reclaim on the mill at a carefully controlled setting and temperature of the mill. An addition of 500 grams of whiting is made after the rubber has formed a band on the front roll. Further additions of 125 grams each of whiting are made as rapidly as they can be assimilated by the rubber. The pigment is constantly swept up from the pan and added to the bite of the roll. As soon as one addition of whiting has been taken up by the rubber, another is added. The mill is opened from time to time to maintain a bank about two inches high. Finally, the stock breaks from the rolls and falls into the pan. This action concludes the test, and the amount of whiting that has been added is taken as a measure of the loading qualities of the reclaim. In such a test, the natural rubber control took up 350% of whiting in 11.8 minutes, and the GR-S whole-tire reclaim took up 400% in 15 minutes. The natural rubber reclaim seems to take the first addition of whiting faster, probably because of its tackier surface.

A GR-S inner tube compound containing no reclaim is shown in Table 8, together with results on one containing a GR-S tube reclaim. Fifty parts of GR-S tube reclaim were used to replace 25 parts of GR-S and 10 parts of SRF black, and the sulphur was raised 0.3%. The resulting compound was slightly lower in tensile strength than the control, but otherwise appeared to be very similar.

[4] *Ind. Eng. Chem.* (*Anal. Ed.*), 6, 56 (1934).

TABLE 5. GR-S HEELS WITH RECLAIM

Formula	X	XI
GR-S	50	50
Natural rubber whole-tire reclaim A	100	..
GR-S whole-tire reclaim B	..	100
Cumar MH-2½	10	10
Stearic acid	1	1
Zinc oxide	3	3
Clay	75	75
Silene EF	20	20
Phenyl beta-naphthylamine	1	1
Sulphur	2.6	3.5
Diorthotolylquanidine	.5	.5
Mercaptobenzothiazole disulphide	1.0	1.0

Formula X—Natural Rubber Reclaim in GR-S Heel

Cure Min @ 316° F.	Stress @ 300%	% Elongation	Tensile P.S.I.	Shore Hardness	Specific Gravity	* Abrasion Loss C.C. per H.P. per Hour*
10	600	500	1000	63	1.33	975
12	590	545	1000	64	...	...

Formula XI—GR-S Reclaim in GR-S Heel

Min @ 316° F.						
10	435	595	960	65	1.34	860
12	490	600	1030	65	...	...

* Williams abrasion machine.

TABLE 6. GR-S RECLAIM IN HARD RUBBER

Formula	XII	XIII	XIV	XV	XVI
Natural rubber whole-tire reclaim (52.5% rubber hydrocarbon)	190				
GR-S reclaim B		200	200	200	200
Sulphur	36	30	35	40	45
Diorthotolylguanidine	1.2	1.2	1.2	1.2	1.2
Lime	4	4	4	4	4
Whiting	70	70	70	70	70
Petrolatum	6	6	6	6	6
Paraffin	2	2	2	2	2
Paraflux	10	12	12	12	12
	319.2	325.2	330.2	335.2	340.2
Minutes cure @ 338° F.	25	35	35	35	35
Elongation, %	1.3%	4%	3.5%	2.5%	1.6%
Tensile, p.s.i.	3875	2550	3280	3740	3480
Shore hardness (Type D)	84	83	85	86	87

TABLE 7. LOADING TEST—NATURAL VS. GR-S RECLAIM

Reclaim (500 g.)	A Natural	B GR-S
Whiting Additions Grams	Minutes	Minutes
500	0.5	0.5
125	1.9	3.0
125	2.7	3.6
125	3.5	4.2
125	4.3	5.5
125	5.2	6.7
125	6.2	7.6
125	7.0	8.5
125	7.7	9.1
125	8.4	9.6
125	9.6	10.4
125	..	11.4
125	..	13.6
Fell off rolls at—minutes	11.8	15.0
Total load accepted—%	350	400
Time when reclaim went to back roll—minutes	1.7	6.7
Average time to add 25% load—minute	0.81	0.94

TABLE 8. GR-S TUBE RECLAIM IN GR-S INNER TUBE RECIPE

Formula	XVII	XVIII
GR-S	100	75.0
GR-S tube reclaim	..	50.0
Paraffin	1.0	1.0
Paraflux	10.0	10.0
Bardol	10.0	10.0
Semi-reenforcing black	40.0	30.0
BLE	1.0	1.0
Zinc oxide	3.0	3.0
Silene	20.0	20.0
Sulphur	1.5	1.8
Diorthotolylguanidine	.47	.47
N-cyclohexyl-2-benzothiozole sulphenamide	1.5	1.5

Formula XVII—GR-S Inner Tube

Cure—Min. @ 312° F.	Stress @ 300%	% Elongation	Tensile P.S.I.	Shore Hardness
4	300	695	955	44
6	290	680	935	45
8	280	700	955	45
10	320	650	900	45

Formula XVIII—GR-S Inner Tube with Reclaim

4	220	735	890	44
6	285	695	895	45
8	255	620	825	45
10	275	710	890	45

TABLE 9. GR-S LIGHT-COLORED MECHANICAL RECIPES

Formula	XIX	XX	XXI
GR-S	100	80	80
GR-S red mechanical reclaim	..	49	..
Natural red tube reclaim	..	..	38
Cumar BX	12	6	9
Clay	75	59	61
Stearic acid	1.5	1.0	1.0
Sulphur	2	2	2
Zinc oxide	4	4	4
Butex	1	1	1
N-cyclohexyl-2-benzothiozole sulphenamide	1.5	1.5	1.5

Cure Min. @ 307° F.	Stress @ 300%	% Elongation	Tensile P.S.I.	Shore Hardness	70 Hours in Air @ 100° C. (212° F.) Stress @ 300% P.S.I.	% Elonga-tion	Tensile P.S.I.	Rebound @ 75° F. %	212° F. %	Flexing 0-150% Revolutions
Formula XIX—GR-S Control										
15	110	1135	675	45	..	..	..	..	..	..
20	150	850	1245	51	510	435	875			
25	155	800	1225	52	500	440	790	40.0	45.5	58,250
Formula XX with GR-S Reclaim										
15	130	890	1030	47	..	..	..	..	..	..
20	140	800	1180	49	495	460	930	..	..	..
25	135	785	1155	50	430	470	885	38.1	48.1	90,000
Formula XXI with Natural Red Tube Reclaim										
15	165	740	945	52	..	..	..	..	..	..
20	185	705	920	53	490	370	630	..	..	..
25	195	700	970	54	405	415	635	40.5	49.8	17,250

TABLE 10. NEOPRENE RECLAIMS IN NEOPRENE COMPOUNDS

Formula	XXII	XXIII	XXIV	XXV
Neoprene GN (GR-M)	100.0	75.0	75.0	75.0
Neoprene reclaim	..	50.0	50.0	50.0
Light calcined magnesia	8.0	8.0	10.0	8.0
Zinc oxide	8.0	8.0	10.0	8.0
Semi-reenforcing black	50.0	50.0	50.0	60.0
Sulphur	..	1.0	1.5	..
Stearic acid	0.5	..	..	..
Circo Light Oil	7.0	7.0	5.0	5.0
Retarder W	0.5	0.5	0.5	0.5
Phenyl beta naphthylamine	2.0	2.0	2.0	2.0

Formula	Cure-Minutes @ 300° F.	Stress @ 300%	% Elongation	Tensile P.S.I.	Shore Hardness	Volume Increase-30-Minute Cure @ 300° F. 813-J Aromatic Blended Fuel 72 Hours @ 80° F.	Circo Light Oil A.S.T.M. #3 Test Oil 72 Hours @ 212° F.	Circo Light Oil A.S.T.M. #3 Test Oil 72 Hours @ 300° F.	62 Octane Gasoline 72 Hours @ 80° F.	A.S.T.M. #1 Test Oil Aircraft Engine Oil 72 Hours @ 300° F.	ANVVO 366B Hydraulic Fluid 70 Hours @ 212° F.
XXII	20	1675	475	2400	63						
	30	1755	470	2500	63	102	69	112	25	8.1	41
	40	1875	470	2560	63						
XXIII	20	925	590	2090	65						
	30	1010	600	2260	60	115	82	110	26	6.0	44
	40	1110	575	2280	61						
XXIV	20	1380	450	1765	65						
	30	1540	420	1910	67	87	60	82	19	1.5	33
	40	1615	365	1870	69						
XXV	20	1480	420	1910	70						
	30	1510	400	1940	70	102	66	120	26	1.5	48
	40	1600	400	1980	70						

TABLE 11. RECLAIMED BUNA N

Cure Minutes	@ ° F.	% Elongation	Tensile P.S.I.	Shore Hardness	Swelling in A.S.T.M. #3 Test Oil (Circo) @ 100° C. (212° F.) 48 Hours %	70 Hours %
20	307	210	830	68	44	42
20	312	180	960	72	41	41

In Table 9 a comparison is shown between a red GR-S reclaim made from hot water bottle scrap with a GR-S control compound containing no reclaim. The normal and aged physical properties were entirely equivalent. The reclaim compound appeared to be slightly less resilient at room temperature, but exhibited greater resilience at 212° F. A flexing test carried out by flexing from 0 to 150% elongation on the De Mattia dumbbell machine revealed that the reclaim actually improved the resistance to flexing. A natural rubber red tube reclaim in the same compound gave much lower resistance to heat aging and flexing.

Neoprene Reclaim

Table 10 shows a comparison between a neoprene compound containing no reclaim and some compounds containing neoprene reclaim E. In Formula XXIII it may be observed that reclaim has imparted lower modulus and higher elongation. The percentage swell in various types of oil has not been greatly increased by the addition of reclaim. In this formula 1% of sulphur was used to obtain a tight cure notwithstanding the fact that Neoprene GN does not ordinarily require the use of sulphur. A higher percentage of sulphur was used in Formula XXIV with the result that the modulus and hardness were increased, but tensile and elongation were decreased. In Formula XXV sulphur was not used, but an increase in the black loading was made. Slight lowering of modulus, elongation, and tensile figures resulted with little change in oil resistance data as compared with the control compound.

Buna N Reclaim

The sample of reclaimed Buna N scrap (reclaim F) when cured in test Formula III had an elongation of approximately 200% and a tensile strength of slightly more than 800 pounds per square inch. Slabs of this compound immersed into A.S.M.T. No. 3 Test Oil (Circo) showed a 41% swell after 48 hours and after 70 hours at 212° F. (Table 11.) An all-reclaim compound made from a reclaim such as this should be useful for many oil-resistant gaskets or similar articles where service conditions are not too severe. More thoroughly plasticized Buna N reclaims are also available. In general these follow the same pattern as the neoprene reclaims in that thorough plasticization requires addition of considerable quantities of oils, and therefore the resulting reclaims have low rubber contents. In the case of Buna N reclaims such large additions of oil and correspondingly low rubber contents give rise to higher tensile strengths than that shown for reclaim F. Tensile strengths up to 1,500 pounds in an all-reclaim test formula are not unusual. The high oil content of such reclaims would make them undesirable for exposure to solvents which might leach out the added plasticizer and cause shrinking of the product. A Buna N reclaim should be more valuable to the compounder if its oil-resisting property is preserved even though tensile strength and elongation are sacrificed.

Butyl Reclaim

In Table 11 results have been given showing the physical properties obtainable in Formula IV with Butyl tube scrap after it has been reclaimed. As mentioned earlier, these results may not necessarily be typical of all Butyl tube reclaims since they were obtained with tube scrap from a single manufacturer. Butyl tube reclaim G has been used in regular production to extend the supply of Butyl

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Recent Russian Literature on Natural and Synthetic Rubber—XIV

M. Hoseh

PREVENTING Losses in Extracting Rubber from the Roots of Kok-saghyz. P. K. Bobkov, "Kauchuk i Rezina," 12, 22-25 (1939). **N-23.**

In the alkaline process of extracting rubber from *kok-saghyz* roots only 75-80% of the rubber is obtained. The rest is lost partly in the filtrate and partly in the slime. The losses are distributed approximately as follows: filtrate 13-15%, slime 5-8%, and wash water 2%. These losses can be reduced drastically, if not eliminated entirely, by recovering the rubber from the liquids (filtrate and wash water) and reworking the solids (slime). The rubber, water, and the solids have different densities (0.92-0.95, 1.0, and 1.5, respectively) and can therefore be separated from each other. This separation is accomplished by applying the principle of Stokes law. The author describes two kinds of traps which essentially are sedimentation apparatus adapted to this purpose. The characteristics, dimensions, rate of flow, etc., of these traps are calculated, and a flowsheet of the process is included. Experiments showed that the proposed improvements cut the losses by 50-60%, thus raising the amount of rubber extracted from *kok-saghyz* to 85-90%.

Measuring the Heat Resistance of Ebonite. L. S. Frumkin and Yu. B. Dubinker, "Kauchuk i Rezina," 21-28 (1940). **SN-58.**

Reviewed are the several existing methods for measuring the heat resistance of ebonite (Martens, Wick, Riding, A.S.T.M.), which are held too arbitrary. The heat conductivity of ebonite is not properly and uniformly accounted for; the test pieces must be quite large; while thin pieces cannot be measured at all; and the results obtained by the various methods differ from one another. The authors devised and describe in detail an apparatus to test the heat resistance of ebonite. Essentially the method consists of pressing a steel plate one millimeter wide under a load of one kilogram into the edge of a rectangular test piece held in a vise at 45-degree angle while the temperature is raised at a rate of 5 ± 1° C. per six minutes. Determinations made with this apparatus at various points of rod and sheet Ebonite showed that the surface and areas adjacent to it are much less heat resistant than the interior of the rods or sheets.

Storing Kok-saghyz Roots and Its Effect on Latex Extraction. A. M. Ignat'ev, R. V. Uzina, and L. D. Erofeev, "Kauchuk i Rezina," 1, 30-33 (1940). **N-24.**

The extraction of latex from *kok-saghyz* due to its dependence on a seasonal crop may have to become a seasonal industry. The drawback of this situation is apparent. The present investigation was concerned with the best methods of storing *kok-saghyz* roots to make possible a year-round operation of the extracting plants. Observations were made of the effect of temperatures between + 60 to -18° C. and of storing methods on the latex content in the roots. The roots withstood temperatures of -12° C. for a month without ill effect on the available latex. Temperatures above 30° C. coagulated the latex in the roots. This condition is primarily due to desiccation of plant tissue. Thus by avoiding these temperature extremes and by storing the roots in a manner that the tissue is not destroyed, *kok-saghyz* roots can be stored the year round. The best way for such storing was found to be in piles covered with a straw mat and thatched with up to 35 centimeters of straw.

Extraction of Gutta Percha. V. N. Provorov, "Kauchuk i Rezina," 1, 33-35 (1940). **N-25.**

As has already been observed by Staudinger, low boiling solvents do not affect gutta percha even at their boiling temperature. It was also observed that solvent-extracted gutta percha ages less than gutta percha obtained by chemico-mechanical processes. This point is explained by the fact that extracted gutta percha contains all the natural tarry substances which are very effective as antioxidants. Experiments of the most efficient extraction method were conducted on spindle tree bark. Best results were obtained by crushing the bark on smooth rolls. This method made possible extracting 99% of the gutta percha. Grinding the bark to a size of one millimeter to three millimeters, however, left unextracted approximately 20% of the gutta percha.

The preferred extracting solvent is benzine. Benzine extracted 100% of the gutta percha in the crushed bark. Benzene yielded approximately only 93%. Furthermore benzine is less toxic, less explosive, and dissolves extraneous matter, notably coloring substances, less than does benzene. The hitherto practiced method of drying the bark before extracting seems superfluous. Good results were obtained without previous drying. Optimum ratio of bark to solvent was found to be 1:6. A higher solvent ratio does not yield more; while at a 1:4 ratio the yield of gutta percha dropped to 88%. Five extractions yielded all the extractable gutta percha. The bark retained approximately 200% its weight of the solvent. Maximum concentration of solution is 20 grams of gutta percha per liter of solution. Favored temperature is 55° C. Nothing is gained by using higher temperatures; while lowering the temperature to 35° C. yielded only 80% of the available gutta percha.

Three processes may be used for separating gutta-percha from the solvent: (1) coagulate the gutta with either alcohol or acetone; (2) precipitate the gutta by cooling the solution; and (3) drive off the solvent. Of these methods precipitation by lowering the temperature of the solution is the preferred one. Since resinous substances remain in solution even when the temperature is lowered, the precipitated gutta appears as a pure snowy loose sediment. Lowering the temperature to from 0 to + 5° C. causes the gutta to separate out. Without agitation, the settling out is rather slow. Stirring the solution at approximately 60 r.p.m. accelerates the process considerably. These laboratory results should be checked on a pilot-plant scale, it was reported.

Recovery of Benzine in the Production of Paronite. K. M. Nikolaevkii, "Kauchuk i Rezina," 1, 44-47 (1940). **SN-59.**

Benzine vapor liberated, while Paronite is rolled into sheets, is sucked up by suction fans and conveyed to an adsorption battery, which consists of adsorption units charged with activated charcoal. These units work in relays, alternatingly adsorbing and desorbing the benzine. The desorption is accomplished with the aid of superheated steam. The steam-benzine vapor is condensed, thus separating H_2O and benzine. A complete description of the installation is given.

The Use of New Benzines in the Rubber Industry. I. I. Lifshits, "Kauchuk i Rezina," 1, 48-50 (1940). **SN-60.**

Because of the scarcity of the benzine "Galosha," a standard-type benzine used in the rubber industry, it became necessary to find suitable replacements. To this end several kinds of benzine, from the Maikop and from the Groznyi fields, were investigated. (The type "Galosha" is from the Baku fields.)

The rigid specifications to be met by a benzine in the rubber industry concern the initial and final boiling points, composition (fractional), and the content of aromatic and unsaturated compounds. Besides the technological requirements, there are health requirements which demand that the vapors given off by rubber adhesives and benzine into the air of the working rooms be non-injurious. Two kinds of benzine from the Maikop fields contained toxic nitro compounds (nitrobenzene and nitrotoluene) and thus were ruled out from use. Some of the Groznyi fields benzines satisfied the requirements and were adopted for use in the industry.

Benzines otherwise satisfactory may vary in their odor. When a new benzine having a different odor is adopted for use, the workers may react apprehensively. To overcome this difficulty the new

benzine is introduced gradually. Over a period of 25-30 days the new benzine was mixed with the familiar "Galosha" in constantly increasing quantities until at the end of this period the new benzine replaced the old one completely. During this period the workers became accustomed to the new odor. The new benzine adopted for use had the following characteristics: specific gravity at 15° C., 0.7260; fraction boiling up to 110° C., 96%; residue of distillation, 1%; grease spot test of residue, absent; aromatic compounds, 2.95%; iodine number, 0.03; S content, 0.014%; aromatic nitro compounds, absent; minimal lethal concentration of vapors (tested on white mice), 70 milligrams per liter; minimal toxic concentration of vapors (tested on white mice), 45 milligrams per liter; paraffinic hydrocarbons, 60%; naphthenic hydrocarbons, 40%.

New Compositions for Impregnating Fabrics Used as Substitutes for Canvas. B. Y. Gorovoi, "Kauchuk i Rezina," 1, 53-57 (1940). **SN-61.**

Fabrics designated NIILV (Scientific Research Institute of Flax Fibers) No. 3 and No. 10 were found to be suitable substitutes for canvas. These fabrics, when saturated with a composition designated as 0_{13} combined with a composition designated as 77 are rendered: (1) fireproof, (2) elastic, (3) waterproof, (4) oilproof, (5) water impermeable, and (6) resistant to sea water. The fireproofing composition 0_{13} contains NH_4Cl, $(NH_4)_2SO_4$ and borax. The other substance is a film-forming composition having either a rubber chloride or a Sovprene base and containing Zn0, talc, or similar filler. As solvent for the film-forming mix was used benzene. The exact composition of the impregnating composition is not given.

Adaptation of SK in Tires. A. M. Kochnev, "Kauchuk i Rezina," 1, 59-60 (1940). **S-38.**

The use of natural rubber in tires has been greatly decreased and replaced with SK. This change did not affect the output of the tire workers and in many instances even raised it. The physico-mechanical properties, as determined on testing machines, were quite satisfactory and showed a normal mileage. For the present natural rubber is still used in such critical places as the breaker of the tire. The production of tires made entirely of SK necessitated working out new recipes and experimentation with new designs. Experiments concluded on 7.00x16 tires made of 100% SK gave an increase of 250-300% in their mileage as compared to the standard size. Experiments are being planned for tires 5.00x16 and 7x34. It is further projected to experiment with 6.50-20, 7.00-20, and other-size tires. In addition to the recipe and the size of a SK tire, the cord used in its assembly is of paramount importance. In view of this fact new types of cord will soon be tried.

Brake Lining Made with Synthetic Latex. V. G. Gerasimova and E. L. Podosenova, "Kauchuk i Rezina," 1, 63-64 (1940). **S-39.**

A new improved brake lining is made of asbestos bonded with a synthetic latex. The asbestos used in the lining is of the IV and V grade. The synthetic latex is a divinyl product known as DAB. As filled is used Zn0, barite, red ocher, kaolin, or chalk. As vulcanizing agent is used S.

The asbestos is disintegrated in a beater, then added to a paste containing fillers and the S. The whole is thoroughly mixed, and the latex added. The latter is distributed evenly over the asbestos fibers and coagulated on them because latex and asbestos carry opposite charges. No coagulating agents are needed. The mass is transferred to a mixer, where it is diluted to the desired consistency. From the mixer the suspension is conveyed to a paperboard machine where it is made into sheets of 5-22 millimeter thickness. The sheets are pressed to remove the excess water, and the dewatered sheets are cut into brake bands of the desired dimensions. The bands are then oven-dried and pressed in a hydraulic press. The extent of compression in the last-mentioned operation affects profoundly the physico-mechanical properties of the brake band. The compressed band is next vulcanized in a conveyer oven and finished.

The production of brake lining with divinyl latex is considerably simpler and requires less time than when the asbestos is bonded with linseed oil, as it was hitherto practiced. The latter method required 12 days; while the use of synthetic latex reduced the time required to 3-4 days. The new method eliminates fire hazards due to linseed oil and white spirits. Braking tests showed that these brake bands are entirely satisfactory.

Determination of Tire Repair Volume. F. K. Miller and M. V. Anchugov, "Kauchuk i Rezina," 1, 65-68 (1940). **SN-62.**

A table is compiled listing the nature of the damage, kind of repair, method of repair, size of damaged area, size of tire, etc. From these data it is possible to estimate the units of work required to repair a given tire.

The Task Facing NIEIRP in 1940. "Rezinshchik." "Kauchuk i Rezina," 2, 3-9 (1940). **SN-63.**

A brief outline of the problems facing the Scientific Research Experimental Institute of the Rubber Industry in 1940, the author stresses the importance of industrial adaptation of SK for making tires and points out some closely related problems, as insuring adequate supplies of SK and study of proper compounding and processing, of tire design, testing methods, etc.

100th Anniversary of the Discovery of Vulcanization by Charles Goodyear. A. A. Yavich, "Kauchuk i Rezina," 2, 9-12 (1940). **N-26.**

This editorial commemorates the great discovery.

Problems in the Field of Raw Materials for 1940. B. A. Sherlina and I. Z. Lisogurskii, "Kauchuk i Rezina," 2, 13-16 (1940). **SN-64.**

An outline of the work to be organized by the rubber industry in 1940 is given. The fulfillment of the task set forth by the industry depends largely on solving the problem of raw material: rubber as well as other ingredients going into the production of rubber products. The properties of various kinds and grades of synthetic rubber, such as Sovprene, SKB, DAB, as well as those of rubber derived from *kok-saghyz*, guayule, gutta percha, etc., depend to a great extent on the method of their production and processing. The desired properties can be made to fit the particular needs when the production of the raw materials is properly directed to this end. The desired properties should be ascertained from the point of view of compounding, and once established, the production of raw material (rubber) should conform to these specifications.

The vast available reserves of old rubber and the industrial waste from rubber plants should be considered as a source of raw material. The regeneration of rubber from this source should be set in motion, and this work preferably organized as a unit. The industrial work in the entire field should be in close cooperation with experimental laboratories where production, compounding, treating, regenerating, etc. should be investigated along with the study of accelerators, fillers, and other ingredients.

Conditions of Working Sovprene of Different Plasticity. D. L. Margolin and L. P. Raspopova, "Kauchuk i Rezina," 2, 21-24 (1940). **S-40.**

The Sovprene supplied at present has a rather narrow range of plasticity: 0.55-0.75. The technological problems involved in processing such Sovprene are quite different from those encountered in handling natural or SK rubber and require independent treatment. Besides this kind of Sovprene, rubber processing plants receive occasionally a hard Sovprene having a plasticity of 0.15-0.20 and a highly plastic Sovprene with a plasticity of up to 0.80-0.85 or even more. These extreme grades of Sovprene are hard to handle. The hard grade crumbles on the rolls; while the highly plastic one sticks excessively to the equipment; besides these off-grades present many difficulties in assembling and vulcanization.

The authors found experimentally that the plasticity of Sovprene is an additive property and that an off-grade plasticity can be corrected by admixing a suitable quantity of another grade of Sovprene. Let P be the desired plasticity, P_h and P_s the plasticities of hard and soft off-grade Sovprene respectively, while A and B are the respective quantities of hard and soft Sovprene in a mixture of the two; then: $P=\frac{P_h.A+P_s.B}{A+B}$. The actual plasticity of such mixes deviates from calculated values by quantities which lie

(*Continued on page* 699)

Channel Blacks in Rubber and GR-S

A Tabular Comparison of the Easy, Medium, and Hard Processing Types, Based on Laboratory Evaluation

R. H. Eagles[1] and C. A. Carlton[1]

WITH the transition from natural to synthetic rubber compounding, greater emphasis has been placed on the distinctive characteristics of the different types of channel carbon blacks. They have been grouped generally into three basic types, described in terms of processing:—easy, medium, and hard, although processing itself is not the only distinguishing element. In terms of ultimate tire service, the laboratory tests of rebound and heat generation are probably of most significance.

Thus far no industry-wide definitions or specifications have been put forward. While the empirical laboratory data in GR-S does not reflect so wide differences between the three types as in natural rubber, nevertheless the three groupings are delineated rather definitely in the appended tabulation.

Referring to the GR-S data, it will be noted that EPC shows 5% faster extrusion than MPC, and 13% over HPC. Tensile figures show a reverse trend against natural rubber, while abrasion data maintain identic relationship. According to heat generation data, EPC-GR-S treads run 15° cooler than MPC, which checks the natural rubber differential. However, since GR-S is so sensitive to heat embrittlement, this differential assumes greater significance.

For the easy processing black, Wyex was used from a standard blend set up at the request of Rubber Reserve Company for the use of all the GR-S plants as the carbon black pigment for control testing. Huber TX and HX standards were used for the medium and hard, respectively. The GR-S used was a blend of equal parts of Firestone-Akron; U. S.-Naugatuck; Copolymer and Goodrich-Borger.

TABLE 1. PHYSICAL SPECIFICATIONS OF BLACKS

	WYEX (EPC)	TX (MPC)	HX (HPC)
325-mesh screen residue—maximum	0.10%	0.10%	0.10%
Ash—maximum	0.10%	0.10%	0.10%
Volatile matter	6.0%	6.0%	6.2%
DPG absorption—Cabot benzene method	40%	42%	45%
Acetone extract—maximum	0.10%	0.10%	0.10%
Color—nigrometer	85	83	81
Sulphur—maximum	0.10%	0.10%	0.10%
pH	4.65	4.65	4.70
apparent density—compact form (pelletized) lbs. cu. ft.	23-25	23-25	23-25

[1] J. M. Huber, Inc., 460 W. 34th St., New York 1, N. Y.

TEST PROCEDURE

(1) Natural rubber—Using master-batch of 60 parts rubber, 38.9 parts carbon black, and 1.1 parts stearic acid, mixed in Schiller mixer, aged 24 hours and remilled on 6- by 12-inch laboratory mill. Data expressed in terms of Wyex at 100%.

(1) GR-S—Using test recipe given above minus sulphur, mixed in Schiller mixer, aged 24 hours and remilled on 6- by 12-inch laboratory mill. Data expressed in terms of Wyex at 100%.

(2) Data expresses % increase in cross-sectional area of extruded cylinder over the cross-sectional area of the die.

(3) Modulus and tensile expressed in pounds per square inch.

(4) Aged 48 hours at 80° C. 300 pounds' oxygen pressure.

(5) Natural rubber—aged 10 days @ 80° C. GR-S—aged 48 hours @ 100° C.

(6) Huber-Goodyear angle slip abrader. Data expressed in terms of Wyex at 100%.

(7) Data expressed in minutes, using 590 pounds' load and 0.180-inch horizontal deflection.

(8) Temperature at geometric center of test piece at end of 45 minutes. Test conditions: natural rubber—590 pounds and 0.17-inch horizontal deflection; GR-S—498 pounds' load and 0.13-inch horizontal deflection.

(9) Goodyear-Healy pendulum. Initial angle—15°.

(10) Du Pont flexing machine. Data expressed in terms of total thickness cracked. Aging period 48 hours @ 100° C.

(11) 300% elongation; hold two minutes; release; rest two minutes, and measure.

(12) 30% deflection. Heat 70 hours @ 100° C.

(13) Test piece thickness = 0.10-inch.

(14) Three-pound dead weight on disks two inches in diameter by ½-inch thick. Data expressed in terms of penetration in thousandths-inch 30 seconds after applying load. In the case of GR-S, penetration was measured five seconds and 30 seconds after applying load.

TABLE 2. COMPOUND FORMULAE AND PHYSICAL TEST DATA

Natural Rubber		GR-S	
Smoked sheet	100.	GR-S blend	100.
Carbon black	50.	Carbon black	50.
Zinc oxide	5.	Zinc oxide	5.
Sulphur	2.75	Sulphur	2.
Captax	.875	Turgum S	8.5
Stearic acid	4.	Altax	1.
Pine tar	2.5	Activex	2.5
Neozone D	1.5		

(Numbers refer to test procedure which follows)	Curing Temperature 274° F.			280° F.		
Code Classification	EPC	MPC	HPC	EPC	MPC	HPC
Huber Classification	WYEX	TX	HX	WYEX	TX	HX
Extrusion rate index (1)	100%	92%	81%	100%	95%	87%
Extrusion swell (1) (2)	103%	91%	84%	146%	146%	146%
Plasticity—Williams—3 min. @ 85° C. (1)	1.88	2.08	2.20	1.70	1.70	1.78
Recovery—Williams—1 min. @ 85° C. (1)	.39	.47	.60	.23	.23	.23
Plasticity—Mooney—ML—4 min. @ 100° C. (1)	87	91	96	65	66	71
Modulus @ 300% elongation (3)	1745	1650	1550	960	890	840
Modulus @ 400% elongation (3)	2590	2480	2400	1460	1350	1290
Tensile at break (3)	4130	4220	4390	2900	2850	2720
Elongation at break	575%	590%	610%	510%	526%	640%
% tensile depreciation—oxygen bomb aged (4)	34%	37%	40%	...	...	...
% tensile depreciation—Geer oven aged (5)	19%	19%	19%	13%	14%	1%
T-50 value—60-min. cure	—10.0° C.	—8.0° C.	—5.0° C.	...	...	...
Abrasion index (6)	100%	103%	106%	100%	103%	105%
Blowout time—St. Joe flexometer (7)	49	40	31	...	...	...
Heat generation—St. Joe flexometer (8)	398° F.	416° F.	450° F.	362° F.	377° F.	385° F.
Energy rebound (9)	67.5%	56%	64.8%	50.4%	48.7%	47.7%
Tear resistance index	100%	105%	112%	100%	100%	105%
Flex cracking index	100%	105%	115%	...	...	...
Cut growth—unaged (10)	...	...	...	75%	60%	52%
Cut growth—Geer oven aged (10)	...	...	...	85%	75%	55%
Permanent set—at break	43%	44%	45%	21%	22%	23%
Permanent set—hold method (11)	7.9%	9.0%	9.6%	7.8%	7.8%	10%
Compression set (12)	17.7%	17.9%	18.0%	15.7%	17.4%	18.1%
Volume resistivity—M-ohm cm.	850	90	22	...	...	...
Electrical breakdown—volts (13)	4000	3150	2300	...	...	...
Shore hardness—unaged	71	70	70	65	65	65
Shore hardness—Geer oven aged	...	...	...	71	71.5	72
Shore creep—unaged	...	...	...	8	8	8
Shore Creep—Geer oven aged	...	...	...	5.5	6	7
A.S.T.M. hardness—unaged (14)	35.4	36.4	36.4	43.5	41.6	41.5
A.S.T.M. hardness—Geer oven aged	...	...	...	36.0	36.0	36.0
A.S.T.M. creep—unaged	...	...	...	3.8	4.1	4.8
A.S.T.M. creep—Geer oven aged	...	...	...	2.3	2.4	2.4

Advances in Plastics during 1944[1]

G. M. Kline[2]

THE resources and energies of the plastics industry during 1944 were spent in performing wartime assignments. But the hopes and plans of all were directed toward the challenge of the reconversion market that will follow "V-E" day. Surveys of potential customers of the industry have indicated that a desire to use plastics more extensively than in prewar years exists, but that experience gained in the manufacture of war materiel has developed a keen appreciation of performance requirements. Forums on potential markets in the merchandising and building fields conducted at the November Conference of the Society of the Plastics Industry (1)[3] gave definite evidence that the plastics industry must adopt simple terminology and recognized standards for its materials in order to gain their fullest acceptance by consumers.

Statistics (2) published during the year indicate that the industry has had a tenfold growth during the past decade. The total production of synthetic resins during 1943 was a record figure of 650,000,000 pounds and will probably approach very close to 700,000,000 pounds for 1944.

A survey (3) of the materials and machines used in compression, transfer, and injection molding revealed that during the war years 1942-1944 there has been a 44% increase in the number of compression presses as compared to a 23% increase in thermosetting molding compound. The 165% growth in thermoplastic molding powder production since 1941 has been accompanied by an 85% increase in the number of injection and extrusion machines, with the capacity of these new machines far exceeding that of the older and smaller machines. These figures give ample evidence of the ability of the plastics industry to handle the volume of business that will accompany resumption of civilian production. Furthermore a tally of the molding industry showed that plans have been made for a 20% postwar expansion.

Materials

The panorama of materials development during 1944 is one of steady growth of the already familiar products rather than the introduction of radically new types of compounds. The wartime arrivals announced in last year's review have now fulfilled their early promise and are making important contributions in war materiel. The properties and potentialities of these materials have been much more fully portrayed in articles published during this past year.

Polyethylene, which has been in commercial production in this country since 1943, is used practically exclusively for the insulation of high-frequency wire and cable. Several reports (4-8) on its characteristics have indicated that many other important uses may be expected from its combination of flexibility and toughness over a wide range of temperature, low water absorption and impermeability to moisture, chemical inertness and excellent electrical properties. These possible applications include containers, gaskets, battery parts, packaging films, chemical equipment, and flexible tubing.

The new class of high polymers called silicones has also been the subject of extensive recent reports (9-10). These organo-silicon oxide polymers include fluids for use over a wide temperature range with little change in viscosity, chemically resistant greases, insulating resins, and high-temperature lubricants. The new high-temperature silicone insulation has made it possible to reduce the size and weight of electrical motors, to increase the service life of insulation in conventional equipment greatly, and to operate in ambient temperatures and humidities much higher than those permissible for previous types of organic insulation. These resins have provided the basis for the greatest advance in electrical insulation since the advent of glass fiber, tapes, and fabrics. Silicones in many other forms of more direct interest to the plastics industry are in the laboratory stage.

Plastics engineers are well aware that the 400-million-pound plant capacity for the manufacture of styrene, built to meet the requirements of the synthetic rubber program, represents a tremendous potential source of raw material for the production of polystyrene and styrene copolymer resins after the war. The forerunners of numerous developments in this field were announced in 1944. The new styrene copolymer resins (11) known as Cerex, have A.S.T.M. heat distortion points ranging from 195 to 300° F., compared with 169° F. for polystyrene. Their mechanical properties are fully equivalent to those of polystyrene, and their electrical properties are superior to most thermosetting materials. Cerex is also characterized by low water absorption, excellent chemical resistance, zero plasticizer content, and—perhaps most important of all for a thermoplastic material—dimensional stability under severe service conditions, as indicated by its resistance to boiling water in a 48-hour test. Actual and potential wartime applications for these compounds include coil forms, condenser cases, battery jars and accessories, crystal holders, switch parts and, surgical instruments.

Another new styrene derivative of improved heat resistance is polydichlorostyrene (12-13), which has been designated as Styramic HT by one manufacturer. This material has an A.S.T.M. heat distortion point at 236° F. and electrical characteristics somewhat better than even polystyrene. Hence it is used for the present in ultra-high frequency insulating parts in secret war equipment.

Styrene resin has also become available in a new form (14) as extremely fine fibers ranging in size up to 0.0002-inch in diameter. This polyfiber makes possible low-pressure bag molding of large thermoplastic polystyrene parts and permits controlled specific gravity gradients throughout the molding up to 1.05. The material is also of interest for thermal insulation and as a replacement for kapok in applications requiring buoyancy, such as floats, life vests, and emergency-rescue equipment.

The vinyl resins continue to expand both in volume of production and versatility of application. The 1944 industry survey showed that present monthly production of plasticized vinyl compounds is in the neighborhood of 15,400,000 pounds, which is a 440% increase over the 1941 figure.

A new series of vinyl-vinylidene chloride copolymers (15) was announced under the name Geon. Resistance to aging, corrosion, solvents, flexing, and abrasion, coupled with the adaptability of the materials to practically all plastic processing techniques, accounts for employment of these vinyl resins in electrical equipment, extruded tubing, screening, gaskets, coated fabrics and papers, packaging films, and molded aircraft and motor vehicle parts.

A high solids water dispersion of vinyl chloride resin (16), known as Geon latex, has been found to be suitable for impregnating paper and fabric and for the manufacture of hospital sheeting and foul weather clothing. The latex method eliminates costly solvents and solvent recovery systems and promotes better adhesion of the resin to fibrous bases.

A somewhat related technique is that utilizing a dispersion of the vinyl resin in a solvent plasticizer or mixture of solvent plasticizer (17). This paste is spread-coated on cloth, dipcoated on forms, or squirted under low pressure into molds, and fused into a homogeneous, tough, elastic film or molding by heating at a temperature of 300 to 350° F.

A vinyl resin made by copolymerizing 85 parts vinyl chloride, 15 parts vinyl acetate, and one part maleic acid was found to give coatings which adhere well to smooth surfaces after air-drying (18). The good adhesion is attributed to the presence of unreacted carboxyl groups contributed by the maleic acid.

Resorcinol-formaldehyde resins (19), which cure rapidly at temperatures from 60 to 150° F. under nearly neutral conditions, have been found to be especially advantageous for assembly bonding of wood and other materials which are deteriorated by the

[1] Presented before the Rubber and Plastics Division of the American Society of Mechanical Engineers, New York, N. Y., Nov. 30, 1944.
[2] National Bureau of Standards, Washington, D. C.
[3] Bibliography references appear at the end of the article.

strong acids used in cold-setting urea and phenolic glues. One resin of this type, called Penacolite, has been used in the production of laminated white oak timbers for shipbuilding, manufacture of plywood sheet and tubing, and bonding of plastics, rubbers and metals. The potential fields of application for these resins in the postwar market include laminating, molding, casting, coatings, and grinding wheel production, as well as bonding of parts for marine use, aircraft, furniture, and building construction.

Portents of things to come in furane resins (20-22) were described during 1944. The raw materials for these resins include furfural, furfuryl alcohol, and furoic acid. One hundred per cent. furane resins which can be molded, laminated, cast, sprayed as air-drying coatings, and used as adhesives and impregnating agents have been developed experimentally.

Important advances were made in the fabrication and utilization of laminates. The unsaturated polyester resins, such as the Columbia Resins (23), Laminac, Marco Resins, Thalid—Monsanto X-500 series, and Plaskon 900, were used to bond glass fibers into sheets which were tested for mechanical strength and other physical properties (24). The rear fuselage section, tail cone, and side panels of the BT-15 airplane were constructed by the Army Air Forces Aircraft Laboratory (25) of glass cloth bonded with Plaskon 900 and subjected to static tests. Detailed information (26-30) on other aspects of the preparation and properties of low-pressure glass laminates was published in conjunction with the announcement of the construction and flight tests on this first successful laminated plastic aircraft primary structure. The influence of various factors on the mechanical properties of paper-base laminates (31-32), and applications (33-34) for this type of material were discussed by several authors.

The terms "sandwich materials" and "expanded (or foamed) plastics" have been frequently mentioned in the plastics literature of 1944 and are destined to become common parlance during the next few years. The advantages of sandwich construction involving stiff, dense faces separated and stabilized by thick, light cores have long been known. In the aircraft industry considerable interest has been stimulated in sandwich materials by the ever-increasing difficulty of maintaining rigid contours in high-speed aircraft. This type of construction was employed for the resin-glass fuselage built by the Army Air Forces. Excellent discussions of the principles and problems involved have been published recently (35-36). Balsa wood has generally been employed on aircraft as the porous stabilizing medium, but research is currently in progress to develop more satisfactory low-density materials from plastics. Phenolic and urea resins, polystyrene, polyvinyl chloride, cellulose acetate, allyl resins, and natural and synthetic rubbers have been expanded into porous structures by various methods (35-38).

Significant reports were published concerning impact-resistant moldings made with pulp (39), and creped paper (40), use of resins in impregnating and bonding wood (41-46), and plastics made from lignin (47-48) and wood (49). Agricultural products as sources of raw materials for the plastics industry were considered in papers dealing with plant residues (50), starch (51-53), and zein (54-55). Other noteworthy papers dealt with the structure of phenolic resins (56), increasing the solvent resistance of cellulose ester moldings (57), and polyvinyl alcohols (58).

Molding and Fabricating

The sweeping advances in the development of high-frequency preheating equipment and the utilization of this technique in speeding production and solving heavy-section molding problems make this process outstanding in the roster of 1944 accomplishments in the plastics industry. The record on industrial parts now being heatronic molded (59-62) is one of amazing reductions in curing time with concomitant savings in manpower and machine hours.. Curing time of a propeller block is reduced from 12 to two minutes; telephone handset eight to three minutes; airplane control pulley five minutes to one minute; ignition part six minutes to one minute. The process has also found further application in the fabrication of parts from plywood (63-64) and laminates (65).

The principles involved in high-frequency heating were reviewed by several authors (61, 66-67). The normal path of the electrons of nominally non-conducting molecules is disturbed by the rapidly alternating electric field, releasing energy in the form of heat. This dielectric hysteresis is comparable to the generation of heat due to mechanical hysteresis when a rubber band is stretched and released rapidly and repeatedly. It has been suggested that, aside from the temperature aspect, the molecular agitation causd by high-frequency heating also greatly accelerates the intermolecular change that takes place during polymerization.

The adaptation of the injection and extrusion molding processes to thermosetting plastic materials has been another highlight of the year. This represents a potential shift of the favorable price factor for small molded parts, in which molding costs bulk high, back to the thermosetting materials which lost it ten years ago to the injection molded thermoplastics. One machine with motor-driven screw has proved in tests to be satisfactory for injection molding and continuous extrusion of thermosetting and thermoplastic materials and natural and synthetic rubbers (68). Experimental rocket launching tubes have been made by the continuous extrusion process with this apparatus. The injection molding process has been used to make truck coil cases from a variety of thermosetting materials (69). Better strength properties, a 250% saving in curing time, and reduction in the number of dies required are among the advantages attributed to this new molding technique. Other innovations in machines for injection (70-72) and extrusion (73) molding were described. Special problems relating to the extrusion of ethyl cellulose (74) and vinylidene chloride (75) were discussed.

Design of molds (76-78) and plastic parts (79-82) and the art of molding generally (83-87), were the subject of many papers published during 1944. The long-standing problem of less costly molds was considered in reports on electrodeposition of molds (88) and the use of cast zinc alloys (89). Fabrication of thermoplastic sheets into aircraft parts and miscellaneous shapes was accomplished by free-blowing (90-92) and die forming (93). Further developments in metal plating of plastics were reported (94-96). The opposite technique of plating plastics on other materials by an electrophoretic process was also described (97). Directions were given for depositing films of rubber, waxes, resins, cellulose, and bitumens.

New information on the spreading and curing of resinous glues in the manufacture of compreg (98) and plywood (99-101) was published. Further advances were made in the art of low pressure molding and laminating (102-104). The post-forming of thermosetting laminates, first described in 1943, became an important factor in the production of large parts for Army bombers, including fairings, ammunition boxes, ejection chute scoops, light brackets, and deflector rings (105). These post-formed laminated parts require approximately one-third the number of tools necessary for the forming of metal, cost about 50% less than the corresponding metal parts, and are from 25 to 50% lighter. The forming properties of vulcanized fiber were also described (106).

Applications

The record of 1944 with respect to utilization of plastics in the war effort has also been primarily one of concentration on items tried and proved in the preceding two years. Bomb buster tubes (107), M-52 fuzes (108), rifle butts (109), resinous coatings for steel cartridge cases (110), medicine containers (111), medical equipment (112), mess trays (113), screening (114), and range-finding equipment (115) are among the long list of Army supplies employing plastics. In fact, the ordnance items mentioned here remind us that plastics, too, are ammunition and that the year-end emphasis on expanded production of bullets and shells means a further tightening of the supply situation. The lookout alidade (116), compasses (117), escape hatch covers (118), and anti-fouling coatings (119) are among the Navy's requirements that continued to be met with plastics.

The outstanding new application of plastics for miiltary purposes in 1944 was the rocket launching tube (120). These tubes which are 10 feet long and have an inside diameter of 4½ inches are mounted in clusters of three on the underside of fighter planes. They are made by rolling paper impregnated with phenolic resin on to mandrels and baking at 105° C. for 6½ hours. Among the advantages attributed to the plastic "flying bazooka", as compared to steel and magnesium tubes, are lighter weight, resistance to corrosion, and reduction of the hazards involved in the event of malfunctioning of the rocket equipment.

Another noteworthy development reported during the past year was the production and evaluation of the plastic housing for the 6 by 42 combat binocular (121). The rigorous requirements for dimensional stability in order to maintain alinement of the optical systems were met by the selection of a phenolic-asbestos composition and thorough stabilization of the housings by a baking treatment. The extreme resistance of the instrument to fungus growth, corrosion, and moisture penetration and its superior behavior in maintaining optical collimation under impact conditions make the plastic binocular exceptionally well suited to amphibious and tropical operations.

The aircraft industry continued to be an important source of new activities in plastics. Several reviews of present practice and future possibilities in this field were published (122-124). Applications described include glider control tabs (125), propeller parts (126-127), turret units (128), oxygen equipment (129), portable hangars (130), navigational instruments (131), flooring (132-133), and signaling lamps (134). Developments in transparent enclosures included a laminate made by bonding methacrylate plastic with an interlayer of polyvinyl butyral to produce a glazing for pressurized cabins capable of being penetrated by machine-gun and cannon fire without shattering (135). Aircraft safety glass (136) of an improved design and streamlined eyes (137) for the B-29 are other 1944 newcomers in which transparent plastics are employed.

Kirksite dies were successfully employed for the molding of antenna mast parts and inner skin frames for aircraft doors (138). Detailed information was supplied regarding the use of plastics for drill and assembly jigs, machining fixtures and mechanical press dies (139-141). Adhesives for bonding metal to metal or wood are of increasing interest to the aviation industry (142-143). The development of a sprayed-on vinyl resin film to protect aircraft during trans-oceanic shipment (144) took its place alongside of the earlier practice of dipping metal parts into a molten ethyl cellulose composition to protect them from corrosion and yet have them ready for immediate use by simply stripping off the plastic film (145).

The building industry continued to explore the possibilities of using plastics in prefabricated housing and other architectural outlets (146-149). Design, standardization, costs, and recommendations regarding research were considered in the report of a British committee on plastics for housing (150). The potentialities of the low-pressure glass-plastic moldings for prefabricated bathroom-kitchen units, refrigeration, furniture, and household appliances are based on low tooling costs for large sections, light weight, and ease of assembly (151). Some thought has also been given to the place of plastics in fluorescent lighting for the home (152).

The textile and coated fabrics industries are employing more and more resins, both in kind and volume, in supplying the demands of the Army and Navy. Comprehensive surveys of technological developments in synthetic fibers (153-156) included rayon, nylon, vinyl, vinylidene, casein, and glass types. Coated fabrics are employed in Quartermaster equipment for raincoats, mountain tents, hospital sheeting, upholstery, bedding bags, and clothing interliners (157-159). Fiber treatments with resins to improve waterproofness, crease-resistance, wearing qualities, dimensional stability, and handling properties are in a stage of active development (160).

Papers were published discussing the uses of plastics in the plating industry (161-162), shoes (163), paper manufacture (164), protective coatings (165-167), transportation (168-172), and physiotherapy (173-175). Developments in pattern plates (176), impregnation of castings (177), cable insulation (178), and brake linings (179) were described. Postwar applications of luminescent pigments (180) and of color in molded products (181-182) were reviewed. A significant trend to informative labeling of plastic products was foretold; the background of this consumer-sponsored movement was outlined, and a plan for developing suitable labels for plastics was presented in an outstanding survey of this subject (183).

Properties, Testing, Specifications

The year 1944 was marked by a further healthy growth of the technical literature on the properties and testing of plastics. The number of such references included herein is almost double that of the 1943 review.

Many valuable data were contained in the papers sponsored by the Rubber and Plastics Division of the American Society of Mechanical Engineers. Three papers on plastics were presented at the semi-annual meeting in Pittsburgh in June; these pertained to dimensional stability of laminates (184), strength properties of cellulose acetate and cellulose nitrate sheets (185), and post-forming of laminates (186). Three further papers were given at the annual meeting in New York in November; these concerned creep properties of phenolic plastics at elevated temperatures (187), permanence properties of cellulose acetate and cellulose nitrate sheets (188), and properties of high-strength paper-base laminates (189). Other reports on plastics and related subjects published by the Society covered investigations of the resistance of phenolic and urea resinous adhesives in plywood to alternating stresses (190-191), strength properties of glass (192) and wood (193-194) laminates, and the fabrication and utilization of plywood (195-199).

The highlight of the year technically was the symposium on plastics held under the auspices of the American Society for Testing Materials in Philadelphia in February (200). Included in this publication are papers on the heat resistance of laminates (201), effect of environmental conditions on the mechanical properties of plastics (202), diffusion of water through plastics (203), stiffness and brittleness of vinyl elastomers (204), behavior of plastics under repeated stress (205), testing of high strength plastics (206), and creep characteristics of plastics (207). Five technical reports on plastics were presented at the annual meeting of the Society in New York in June; these related to indentation hardness (208), impact testing (209), creep tests of paper-base laminate (210), and flow properties of phenolic laminates at elevated temperatures (211), as well as fatigue tests on compreg (212).

Important contributions were made to our knowledge of the creep (213-215), shear (216-217), impact (218), bearing (219), flow (220-221), electrical (222), optical (223), and thermal expansion (224-225) properties of plastics. The water absorption and permeability to moisture of various materials were reported (226-230). Gas permeability of plastic films was studied by two authors (231-232). Properties of plywood (233), compreg (234), phenolic laminates, (235-236), and methacrylate sheets (237) were described. Other topics discussed in the literature included the relation between test data obtained on standard specimens and the properties of molded plastic parts (238-239), solubility of plasticizers in liquid ammonia (240), and ion exchange resins (241).

Three noteworthy contributions were made to the identification of plastic materials (242-244). A method for the determination of the plasticizer content of cellulose plastics was published (245). Tests for measuring impact strength (246) and scattering of light by plastics (247) were described.

Committee D-20 on Plastics of the American Society for Testing Materials completed action on five test methods, three recommended practices, and four new specifications for plastics (248). The testing procedures pertain to the measurement of flexural strength, indentation hardness, luminous reflectance and transmission characteristics and color, specific gravity, and stabiilty of chlorine containing plastics. The recommended practices are for determination of the permanent effect of heat, accelerated weathering of plastics using the S-1 bulb and fog chamber, and molding impact specimens of general-purpose phenolic materials. The four specifications covered cellulose acetate sheets and ethyl cellulose, methacrylate and nylon molding compounds.

Standards for plastic fittings and tubing adopted by the National Aircraft Standards Committee were published (249). Tolerances for laminated plastics (250) were discussed with emphasis on the specification of the maximum safe tolerance in order to expedite deliveries under wartime conditions.

The formation of A.S.T.M. Committee D-14 on Adhesives was announced during the year (251). Subcommittees on strength properties, analytical tests, permanence properties, working qualities, specifications, and nomenclature have been organized. The cooperative efforts of producers, users, and other interested parties in the activities of this committee should lead to uniform testing procedures and valuable data on the properties of all types of adhesives and promote the development of improved resinous bonding materials.

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Reclaimed Synthetic Rubber

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by one tube manufacturer with satisfactory results.

A point of interest in this connection is the importance of eliminating any trace of natural rubber or GR-S scrap which may be present as contamination in the Butyl tube scrap. As little as 5% of such contamination makes it impossible to vulcanize the reclaim thus contaminated. In this case the contaminating rubber apparently absorbs the sulphur much faster than the Butyl hydrocarbon and thus leaves the latter essentially unvulcanized.

Mention should be made here of the importance of segregating the several kinds of synthetic scrap and of keeping them separate from rubber scrap. Much has been accomplished in this direction by reclaimers and by scrap dealers. Contamination of synthetic with rubber scrap or *vice versa* has the effect of raising the cost to the consumer of the reclaim and at the same time of lowering the quality. The rubber manufacturer will be helping himself if he insists on careful segregation of various kinds of scrap.

No attempt has been made in this paper to discuss the effect of reclaimed synthetic rubber on tire tread wear. It is generally agreed that reclaimed rubber causes treads to wear faster in proportion to the amount used, and there is no reason at the present time to expect that different results would be obtained by using GR-S reclaim. Since most manufacturers are interested in securing maximum tread life, it is probable that very few experiments in the direction of producing cheaper tread stocks for third- and fourth-quality tires have yet been undertaken. Such road test data as are available indicate that GR-S reclaim will perform at least as well as natural rubber reclaim in tread compounds. Smoother tubing stocks may be expected to result from the use of GR-S reclaim in tread compounds.

It is the opinion of the writer that the reclaimed rubber industry has worked out methods to reclaim all important types of synthetic scrap and is ready to produce a uniform, high-quality product which will command the interest of the rubber compounder when natural rubber scrap, which is more easily and more cheaply reclaimed, becomes scarce.

Summary

1. GR-S reclaim possesses physical properties equal to those of natural rubber reclaim. GR-S reclaim is less tacky and more inert than natural rubber reclaim. GR-S reclaim takes up pigment load somewhat slower, but can be loaded at least as much as natural rubber reclaim and gives smoother, better tubing products.

2. The absence of alkali in GR-S reclaim results in slower cures which can be offset by lengthening the time of cure, raising the temperature of the cure, or increasing the amount of sulphur from approximately three parts per 100 of reclaimed rubber hydrocarbon to five parts.

3. Satisfactory soft and hard rubber formulations can be made with GR-S reclaim replacing natural rubber reclaim.

4. Neoprene reclaim may be used in conjunction with new neoprene with only slight loss in oil-resisting properties.

5. Buna N reclaims with little or no added oils are available with excellent oil-resisting properties which should make them valuable for cheap oil-resisting products.

6. Butyl tube scrap can be reclaimed and reused in Butyl compounds provided care is taken to prevent contamination of the Butyl scrap.

7. An alkali-type GR-S reclaim would be desirable since the compounder expects reclaim and reclaimed rubber compounds to cure rapidly.

The author expresses appreciation to members of the laboratory of the Xylos division of the Firestone Tire & Rubber Co. for assistance in securing the data presented in this paper.

Recent Russian Literature

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within the experimental error. The physico-mechanical indices for such mixes are higher than for the individual components. The fact that hard Sovprene, which is insoluble in chloroform when mixed with soft Sovprene, which is completely soluble, yields a product quite soluble in $CHCl_3$ seems to indicate that on mixing the two there occurs swelling or even dissolution of the hard grade in the soft. Best results are obtained by first working the hard grade on rolls and then adding the soft grade in small portions; otherwise there will be formed local soft areas unevenly distributed. The mixing is carried out on rolls maintained at a temperature of 25-30° C.

(*To be continued*)

Welco Fog-Free Goggle

Goggle Has Polaroid Plastic Lens

THE Welco fog-free goggle has a single wide-aperture non-polarizing lens of flexible, shatter-resistant plastic. Because there is no break at the nose, as in two-lens goggles, true binocular vision is obtained over a wide field. The curve of the flexible lens widens the aperture still further and maintains the snug fit of the goggle. The frame is of fully molded mechanical rubber. Flexible, with yielding rolled-rubber edges, the goggle is said to fit all faces closely. Its cushioned face surfaces distribute the light weight of the frame and the light pressure of the elastic headband uniformly.

The inhalation of the wearer draws air through the intake ports at each side of the goggle. The intake ports are fitted with felt diffusers which regulate the intake and filter out dust and flying particles. With every breath the air sweeps in through the ports, across the inside of the lens, and into the nosepiece, removing moisture before the lens can fog. The air behind the lens is changed at least 48 times a minute. Exhaling closes the inlet valve and opens an outlet valve, allowing escape of moist air. The polaroid lens, easily replaced, is said to remain clear and free of frost in still air as cold as -35° F. Welsh Mfg. Co.

Specification for GR-S Latices[1]

THE following three types of GR-S latex have been established:

GR-S Latex, Type I. This latex is the same as the latex from which standard GR-S is made by coagulation and drying and contains a butadiene-styrene ratio specified for standard GR-S.

GR-S Latex, Type II. This latex is the same as Type I except that the antioxidant is omitted.

GR-S Latex, Type III. This latex is made by charging approximately equal parts by weight of butadiene and styrene in a polymerization formula. This latex does not contain antioxidant or other stabilizer.

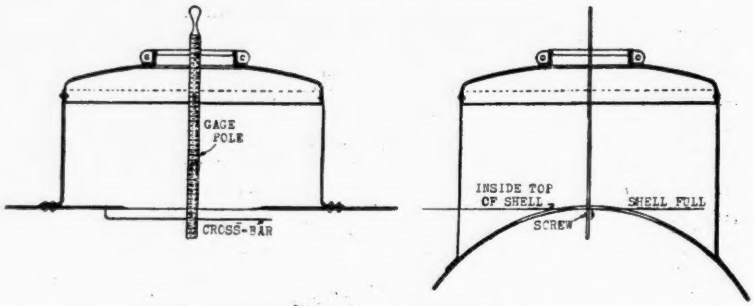


Fig. 1. Use of Gage Pole in Latex Tank Car

Specification Limits[2]

I. General

All GR-S latices shall be free from foreign or extraneous material which is objectionable in normal latex practice.

II. Chemical

A. Total Dry Latex Solids (TDLS)

For Type	% Minimum	% Maximum
I	27	29
II	27	29
III	37	39

B. Residual Styrene: For all three types, 0.75% maximum on the total latex.

III. Physical

A. pH-for Type	Minimum	Maximum
I	8.50	9.25
II	8.50	9.25
III	9.50	11.50

Gaging of Tank Cars

See to it that the tracks on which the tank car is spotted for gaging are level. Do not gage the car immediately after it has been moved, but allow approximately 30 minutes for the liquid level to come to rest. When mounting the tank car to take the gage reading, avoid as much as possible any movement of the car. When manipulating the gage, stand near the middle of the car to avoid rocking the car.

Use a gage pole of the type shown in Figure 1. Open the cross-bar to a "T" position and slip it under the shell with the cross-bar running lengthwise of the car. With the gage pole in a vertical position and the cross-bar held firmly against the shell, read the liquid level to the nearest ⅛-inch.

Determine the volume of the car by referring to the outage table supplied with the car. Figures below "O" give the outage in the tank. Figures above "O" give inches in the dome.

Sampling

Thoroughly mix the contents of the tank car and obtain a sample as follows:

Mix the latex in the tank car by means of a jet of air at 25 to 30 p.s.i. from a 0.5-inch pipe inserted through the dome cover of the car and moved continuously throughout the body of the latex for at least 30 minutes.

Attach three clean, dry, one-liter narrow-mouthed (aperture one-inch maximum) sample bottles to a 10-foot steel rod at intervals to correspond to the bottom, middle, and top (approximately six inches below the surface) of the latex in the car. Place a thermometer in each bottle.

As soon as the contents of the car have been thoroughly mixed as above, lower the sampling bottles and rod rapidly into the latex. Leave the bottles in the latex for five minutes. Then withdraw the bottles and immediately read the temperature of the latex in each bottle with an accuracy of 0.1° C. (0.3° F.). Stopper the bottles tightly as soon as possible.

In the laboratory combine the contents of the three bottles to obtain a blended sample for analysis. Determine the specific gravity of the blended sample by means of a hydrometer or pyknometer accurate to 0.0005. Average the three temperatures determined for the three samples, and take this average as the temperature of the latex in the car.

I. Chemical

A. Total Dry Latex Solids (TDLS). If the temperature of the latex sample is above room temperature, allow it to cool to room temperature.

Accurately weigh approximately one gram of latex to the nearest 0.1-milligram in a covered ointment tin having a capacity of approximately two ounces, a minimum diameter of 1½ inches, and a maximum height of ⅞-inch. Dry the sample to constant weight at 105° C., to the nearest 0.1-milligram. Make duplicate determinations. Average the values if they are within 0.1%. If not, make additional duplicate determinations until duplicate values do agree within 0.1%.

Calculation

$$\text{TDLS, \%} = \frac{100\ (C - A)}{(B - A)}$$

A = the weight of the ointment tin.
B = the weight of the tin plus the original sample.
C = the weight of the tin plus the dried sample.

B. Residual Styrene. To a 25-milliliter sample of latex in a 250-milliliter, wide-mouthed Erlenmeyer flask, add 25 milliliters of water and 25 milliliters of synthetic methanol (or "2B" denatured methanol) containing 100 ppm. of tertiary butyl catechol to prevent styrene polymerization. Be sure to add the materials in the following order: (1) latex; (2) water; (3) methanol (or ethanol) containing TBC.

Distill the mixture. Discard the first 15 milliliters of distillate. Collect the next 25 milliliters in a 250-milliliter glass-stoppered bottle, and add 20 milliliters of alcohol containing 100 ppm. of tertiary butyl catechol. Add 15 milliliters of 18% sulphuric acid, and from a buret add 20 milliliters of 0.1N standard bromide-bromate solution. Stopper the bottle; shake it, and let it stand for at least 30 seconds. If no yellow color remains, add successive 10-milliliter portions of the standard bromide-bromate solution in the same manner until a permanent yellow color is formed.

Add 10 milliliters of 10% potassium iodide solution; shake the mixture, and titrate the liberated iodine with 0.1N sodium thiosulphate solution to the starch-iodine end point.

Calculation

$$\text{Styrene, \%} = 0.208(AB - CD).$$

A = the milliliters of bromide-bromate solution used.
B = the normality of the bromide-bromate solution.
C = the milliliter of thiosulphate solution used.
D = the normality of the thiosulphate solution.

II. Physical

A. pH Determination. Assemble the electrode unit as shown in Figure 2. For convenience, clamp the electrodes permanently in place, and rest the vessel containing the solution to be measured on a movable iron ring covered with a wire gauze. Add potassium chloride solution to the reservoir. Make sure that all air bubbles are out of the bridge. Immerse the glass electrode and the tip of the bridge into 30 milliliters of a standard buffer solution. Calibrate the pH meter by adjusting the meter to the pH of the standard buffer according to the instructions supplied with the meter. Take care to compensate for temperature. Turn the stopcock on the bridge, and readjust the meter with the potassium chloride flowing. Remove the buffer; turn off the stopcock, and wash the tip of the bridge with a jet of distilled water.

Adjust to 20° C. a 100-gram sample of latex in a 250-milliliter beaker, using a constant temperature bath. Immerse the glass electrode and the tip of the bridge into the sample. With a glass propeller-type stirrer, stir the sample until all the surface films are blended into the latex. Determine the pH of the latex with the bridge flowing.

Turn off the stirrer; remove the sample, and wash the glass electrode and the tip of the bridge with distilled water. Close the stopcock of the salt bridge, and store the apparatus with both electrodes and the bridge immersed in distilled water.

[1] As issued by Rubber Reserve Co., Washington, D. C.

[2] All specification limits include the tolerances of the test method. Any lot represented by a sample which fails in one or more tests to meet the specification limits may be retested. For this purpose two additional samples shall be taken according to the same procedure as the original sample. Failure of either in any respect shall be cause for rejection.

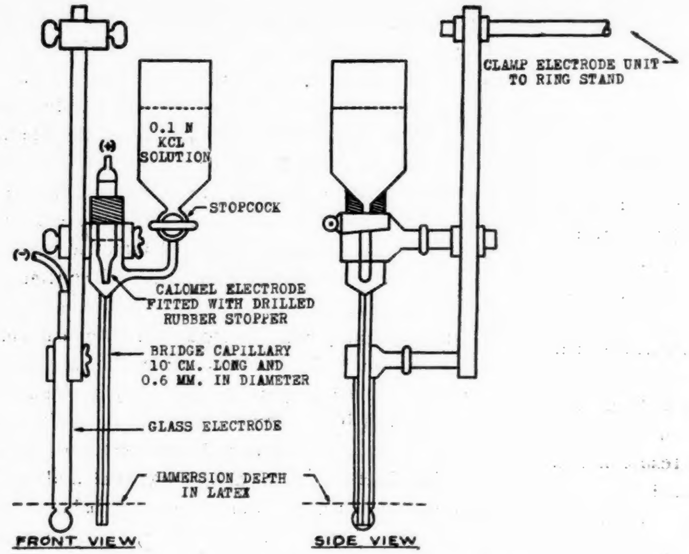


Fig. 2. Electrode Assembly for pH Determination

TABLE 1. RELATIVE DENSITIES AND RELATIVE VOLUMES—GR-S LATEX, TYPE I AND II

Temperature ° F.	RD Relative Density	RV Relative Volume
40	1.0059	0.9942
41	1.0058	0.9943
42	1.0057	0.9944
43	1.0056	0.9945
44	1.0054	0.9946
45	1.0053	0.9947
46	1.0052	0.9948
47	1.0051	0.9950
48	1.0049	0.9951
49	1.0048	0.9952
50	1.0047	0.9954
51	1.0045	0.9955
52	1.0044	0.9956
53	1.0042	0.9958
54	1.0041	0.9959
55	1.0039	0.9961
56	1.0038	0.9962
57	1.0036	0.9964
58	1.0035	0.9965
59	1.0033	0.9967
60	1.0032	0.9969
61	1.0030	0.9970
62	1.0028	0.9972
63	1.0026	0.9974
64	1.0025	0.9975
65	1.0023	0.9977
66	1.0021	0.9979
67	1.0019	0.9981
68	1.0018	0.9982
69	1.0016	0.9984
70	1.0014	0.9986
71	1.0012	0.9988
72	1.0010	0.9990
73	1.0008	0.9992
74	1.0006	0.9994
75	1.0004	0.9996
76	1.0002	0.9998
77	1.0000	1.0000
78	0.9998	1.0002
79	0.9996	1.0004
80	0.9994	1.0006
81	0.9992	1.0008
82	0.9990	1.0010
83	0.9987	1.0013
84	0.9985	1.0015
85	0.9983	1.0017
86	0.9981	1.0019
87	0.9979	1.0022
88	0.9976	1.0024
89	0.9974	1.0026
90	0.9972	1.0028
91	0.9969	1.0031
92	0.9967	1.0033
93	0.9965	1.0035
94	0.9962	1.0038
95	0.9960	1.0040
96	0.9958	1.0043
97	0.9955	1.0045
98	0.9953	1.0047
99	0.9950	1.0050
100	0.9948	1.0052
101	0.9945	1.0055
102	0.9943	1.0057
103	0.9940	1.0060
104	0.9938	1.0063
105	0.9935	1.0065
106	0.9933	1.0068
107	0.9930	1.0070
108	0.9928	1.0073
109	0.9925	1.0076
110	0.9922	1.0078
111	0.9920	1.0081
112	0.9917	1.0084
113	0.9914	1.0086
114	0.9912	1.0089
115	0.9909	1.0092
116	0.9906	1.0095
117	0.9903	1.0097
118	0.9901	1.0100
119	0.9898	1.0103
120	0.9895	1.0106

TABLE 2. RELATIVE DENSITIES AND RELATIVE VOLUMES—GR-S LATEX, TYPE III

Temperature ° F.	RD Relative Density	RV Relative Volume
40	1.0069	0.9931
41	1.0068	0.9933
42	1.0066	0.9934
43	1.0065	0.0036
44	1.0063	0.9937
45	1.0062	0.9939
46	1.0060	0.9940
47	1.0059	0.9942
48	1.0057	0.9943
49	1.0055	0.9945
50	1.0054	0.9947
51	1.0052	0.9948
52	1.0050	0.9950
53	1.0049	0.9952
54	1.0047	0.9953
55	1.0045	0.9955
56	1.0043	0.9957
57	1.0041	0.9959
58	1.0039	0.9961
59	1.0038	0.9963
60	1.0036	0.9964
61	1.0034	0.9966
62	1.0032	0.9968
63	1.0030	0.9970
64	1.0028	0.9972
65	1.0026	0.9974
66	1.0024	0.9976
67	1.0022	0.9978
68	1.0020	0.9980
69	1.0018	0.9983
70	1.0015	0.9985
71	1.0013	0.9987
72	1.0011	0.9989
73	1.0009	0.9991
74	1.0007	0.9993
75	1.0005	0.9995
76	1.0002	0.9998
77	1.0000	1.0000
78	0.9998	1.0002
79	0.9995	1.0005
80	0.9993	1.0007
81	0.9991	1.0009
82	0.9989	1.0012
83	0.9986	1.0014
84	0.9984	1.0016
85	0.9981	1.0019
86	0.9979	1.0021
87	0.9971	1.0024
88	0.9974	1.0026
89	0.9972	1.0028
90	0.9969	1.0031
91	0.9966	1.0034
92	0.9964	1.0036
93	0.9962	1.0068
94	0.9959	1.0041
95	0.9957	1.0044
96	0.9954	1.0046
97	0.9951	1.0049
98	0.9949	1.0051
99	0.9946	1.0054
100	0.9944	1.0057
101	0.9941	1.0059
102	0.9938	1.0062
103	0.9936	1.0065
104	0.9933	1.0067
105	0.9930	1.0070
106	0.9928	1.0073
107	0.9925	1.0076
108	0.9922	1.0078
109	0.9919	1.0081
110	0.9917	1.0084
111	0.9914	1.0087
112	0.9911	1.0090
113	0.9908	1.0093
114	0.9905	1.0095
115	0.9903	1.0098
116	0.9901	1.0101
117	0.9897	1.0104
118	0.9894	1.0107
119	0.9891	1.0110
120	0.9888	1.0113

Determination of Weight of Total Dry Latex Solids in Tank Cars

Calculate the total dry latex solids in the tank car shipment as follows:

$$TDLS = V \times RV \times D \times RD \times S \times 8.345.$$

V = the volume of the shipment as determined under "Gaging of Tank Cars."

RV = the factor for correcting the volume from the temperature of the latex in the tank car (as determined under "Sampling" to 77° F. This factor is obtained from Table 1 or Table 2, depending upon the type of latex.

D = the specific gravity of the latex referred to water at 77° F., as determined under "Sampling."

RD = the factor for correcting the specific gravity from the temperature at which it is measured to 77° F. This factor is obtained from Table 1 or Table 2, depending upon the type of latex.

S = the total dry latex solids content of the latex, as determined in Section I-A under "Method of Analysis."

8.345 is the pounds of water per gallon at 77° F.

Approved—December 5, 1944
Released—December 12, 1944
Effective—January 1, 1945

Commodity Exchange Elections

Philip B. Weld, of Harris Upham & Co., was reelected to a third term as president of Commodity Exchange, Inc., 81 Broad St., New York, N. Y., and Floyd Y. Keeler, of Orvis Bros. & Co. was reelected treasurer. Louis V. Keeler, of Avia Co., was elected vice president of the Rubber Group on the Exchange; while Aage Bendixsen, of Hecht, Levis & Kahn, Inc., and Nathan W. Diamond were named to the board of governors of the Exchange to represent the Rubber Group.

EDITORIALS

Rubber Balance May Be Automatic

A GREAT number of statements have been made and articles published during the past several months on the subject of the coming battle between natural and synthetic rubber for the major portion of the world's market for this material. From these recorded opinions and from discussions with various men prominent in industry and government, whose major concern is the future of the rubber industry both in this country as well as in the entire world, certain important factors that will contribute most to the final result of this battle are becoming more or less well defined.

First, it is generally agreed that it will require two or three years to obtain maximum production from the Far Eastern rubber areas, after their recovery from the Japanese. Second, during these two or three years the limited amount of "native" natural rubber available will be allocated among the world's consumers by the Combined Raw Materials Board or some modification of it, and the countries having no synthetic rubber industry able to take care of most of their needs will receive the largest amounts of this natural rubber. Third, the natural rubber producing industry in the Far East will be operated by government-controlled organizations, since private producers could not manage the heavy cost of reconstruction without unduly delaying maximum output. Fourth, during this transition period natural rubber will be much more variable in quality, and most of it will probably sell at a higher price than in the years preceding World War II.

With regard to synthetic rubber, first, it will continue to be in heavy demand in the United States and to a lesser extent abroad during the transition period. Second, if advances in production techniques and the results of research and development work on new polymers and their use continue at the present rate, synthetic rubber may retain more than half of the world market by consumer preference. Third, if the production of natural rubber is to be under government control during the transition period, the production of synthetic rubber in this country may remain under government control also during this period.

The pent-up demand for consumer goods both at home and abroad and the demands of reconstruction abroad should maintain employment at a high level during the immediate postwar period. If the trend in that period should be for a somewhat greater degree of cooperation between nations in the interests of maximum national and international productivity and trade, a new record of world rubber consumption might be established.

A consideration of these and other factors that have a bearing on this question of natural *versus* synthetic rubber usage does suggest that perhaps the conclusion of the International Rubber Study Group after its recent meeting in Washington that: "It appears therefore that a marked disequilibrium between the production capacity of the world and the demands for consumption could develop in the course of a few years after the liberation of the Far East," should not be viewed with too much pessimism. Certainly there are many reasons for believin gthat the expectations of another statement of the Group that: "It is further expected that the past rapid development of new uses for rubber will continue and may well be accelerated by the advances scientists have made in developing new physical and chemical characteristics in rubber and rubber-like materials" are justified.

There should be a greater than prewar demand for large volumes of both natural and synthetic rubbers even after the accumulated deferred war-restricted product demand has been satisfied, and if national and international economics are not too far out of balance at the end of the immediate postwar period, the balance between the demand for natural and the demand for synthetic rubbers should be arrived at automatically and should result in the consumption of something approaching equal amounts of both types.

Non-"Selective" Service Again

IF THOSE in charge of the logistics of this war want production of heavy-duty tires increased to a rate of 28,000,000 units a year by 1946 and peak production of synthetic rubber and other rubber products maintained, the recent Selective Service order denying deferment for all except possibly 30% of the men in the 18- through 33-year age group is a good way to insure failure to supply enough urgently needed rubber products. Last year the men in the 18- through 25-year age group would have been removed almost completely from the rubber industry except for the rather strong bargaining power of the Office of the Rubber Director, but this year the WPB Rubber Bureau's bargaining power is much less strong.

New plants and additions to present tire plants are being built with more than $70,000,000 of government money in order to be sure of an adequate supply of tires for what is hoped will be the final phase of both wars. It has not been possible to recruit and retain the manpower to operate all the present facilities, and if it had not been for decision arrived at only recently, to furlough men from the Armed Services for work in the tire plants, the tire production outlook would not be so satisfactory as it is, in view of the very greatly increased demands.

More than half of the men involved are chemists, engineers, technicians, or skilled production workers, whose training and experience cannot be replaced overnight. Their efforts during the next several months at their present posts might provide the tires to win the war. Placing them in training camps for the next several months might lose enough tire production to delay unnecessarily winning the war.

Scientific and Technical Activities

Baekeland Award to Gilliland

THE first recipient of the Leo Hendrick Baekland Award of the North Jersey Section, American Chemical Society, is Edwin Richard Gilliland, former Assistant Rubber Director and professor of chemical engineering at Massachusetts Institute of Technology now on duty with the Office of Scientific Research and Development, Washington, D. C., it has been announced by Horace E. Riley, chairman of the Section.

The award, consisting of $1,000 in cash and a gold medal, is given biennially to an American chemist under 40 in recognition of accomplishments in pure or industrial chemistry. The award, founded only last year by the North Jersey Section and the Bakelite Corp. to commemorate the industrial achievements of Leo Hendrick Baekeland, will be formally presented at a meeting of the Section in Newark, N. J., on May 14.

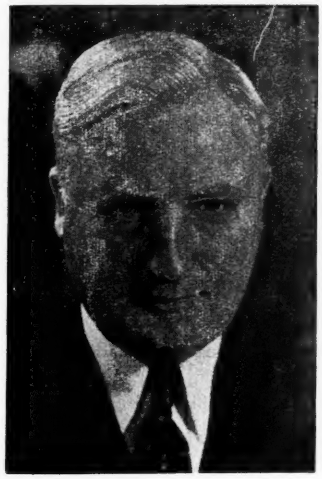
Dr. Gilliland, who was born in El Reno, Okla., on July 10, 1909, was cited for outstanding achievement in the fields of heat transmission, diffusion, distillation, and high-pressure synthetic chemistry. He received the degree of Bachelor of Science from the University of Ilinois in 1930, the Master of Science degree from Pennsylvania State College in 1931, and the degree of Doctor of Science from Massachusetts Institute of Technology in 1933. He joined the teaching staff in 1934 and in 1944 was made a full professor.

The jury of award was composed of Dr. Riley, chairman; E. R. Allen, C. S. Fuller, D. L. Cottle, Per K. Frolich, and T. R. Donlan.

A.I.C. Medal to J. W. Thomas

THE Gold Medal of the American Institute of Chemists has been awarded to John W. Thomas, chairman of the board of the Firestone Tire & Rubber Co., in recognition of his leadership in rubber research for four decades and for achievements under his direction in the development and production of synthetic rubber. Announcement of the award, presented annually for "noteworthy and outstanding service to the science of chemistry or the profession of the chemist in America," was made by Gustav Egloff, of the Universal Oil Products Co. and president of the Institute. The jury of chemists making the award was composed of Dr. Egloff; Harry L. Fisher, U. S. Industrial Chemicals, Inc.; Robert J. Moore, Bakelite Corp.; Maximilian Toch, Toch Bros., Inc., and Standard Varnish Works; and Howard S. Neiman, secretary of the Institute.

Mr. Thomas installed the first chemical laboratories at Firestone in 1908 and has taken an important part in establishing chemical research as a major arm of industry. His executive ability in translating research results into large-scale production was a major aid in the development of America's wartime synthetic rubber industry, and Mr. Thomas also directed the Firestone research program which developed tires made from synthetic rubber more than a dozen years ago. During the last year he has supervised the design and construction of a $2,000,000 Firestone research laboratory, which is one of the most modern and complete in the world. This laboratory will be dedicated within the next few months. Mr. Thomas, who graduated from Buchtel College, now Akron University, in 1904 with a degree of Bachelor of Science, is now the directing head of all the world-wide operations of the Firestone company.



John W. Thomas

Formal presentation of the medal will be made on May 11 at Columbus, O., during the twenty-third annual meeting of the American Institute of Chemists.

Thiokol Club Hears Blake

ANOTHER open meeting of the Thiokol Technical Club was held in the conference room at the Thiokol Corp., Trenton, N. J., February 8. John T. Blake, of Simplex Wire & Cable Corp., was the principal speaker. M. S. Patel, of the Government of British India, Bombay, India, also reported on the rubber industry of India. The meeting, preceded by a social hour and dinner served in the company cafeteria, was attended by 26 members and 58 guests. Edward Fettes, of the Thiokol Technical Club, was in charge of the meeting.

Dr. Blake in his talk discussed the present state of knowledge of the vulcanization reaction. One of the chief difficulties in examining the various theories of vulcanization is that while vulcanization is a chemical reaction, we are forced to use physical methods to measure the extent of the reaction, he stated. Physical test data and thermal data were presented by means of slides, and the speaker showed how well they fitted in with the theory of a superimposition of two different reactions, the ideal soft rubber reaction and the hard rubber or ebonite reaction. The subject of non-sulphur vulcanization was also considered by the guest speaker.

Following a very interesting discussion period, during which Dr. Blake answered questions from the audience, Dr. Patel presented a brief outline of the status of the rubber industry in this country.

Synthetic Rubber to Stay

BEFORE an audience of about 300 at the Engineering Societies' Bldg., New York, N. Y., on February 19, E. F. Riesing, chief automotive engineer, Firestone Industrial Products Co., Detroit, Mich., in a talk on "Synthetic Rubber in Automotive Chassis—Status and Future Possibilities" stated that for each essential property of automotive rubber at least one of four synhetics (Buna S and A, neoprene, and Butyl) proves superior to natural rubber. He further declared that even after the war, when the sources of natural rubber are once more restored to us, synthetic rubber, with the many improvements being made on it as time goes by, because of its better qualities for the intended purpose will continue to be used instead of natural rubber for many parts in automobiles.

Mr. Riesing, who is chairman of the national Division of Rubber & Plastics of ASME, demonstrated in his address the outstanding properties of various synthetic rubbers, using dynamic equipment and apparatus to substantiate the superiority of the synthetics in specific physical properties such as resilience, efficiency, low-temperature flexing, low-temperature brittleness, high-temperature stability, oil resistance, resistance to ultra-violet rays, ozone, acid, gas diffusion, etc.

Practical application data were presented, too, on the temperature effects of synthetic rubbers studied under wind tunnel conditions, both at high temperatures simulating African desert operation and at low temperatures similar to Alaskan operations. A type of synthetic rubber, one of the polybutadiene compounds, which will not freeze or become brittle under sub-stratosphere conditions, was demonstrated with special low-temperature equipment. This type of synthetic freezes at -100° F.

Mr. Riesing, furthermore, compared synthetic and natural rubbers in a study of static compression and shear modulus, and of dynamic compression and shear modulus. The latter study has been conducted at both low frequencies of natural vibration and at high forced frequencies equal to those encountered in practical mechanical applications. Hysteretic and elastic properties, creep and stress relaxation under load, change of modulus (stiffness) with time at elevated temperatures, likewise were discussed.

This talk was also amply illustrated by pictures of machines used and charts depicting the results of the many tests of physical properties made on the various synthetics as compared with natural rubber. The address was interrupted several times for demonstrations of tests supporting Mr. Riesing's points and conducted by Frank King, also of the Firestone organization. The audience took advantage of the speaker's offer to answer questions, many of which were referred to J. H. Dillon, manager of the physics division, Firestone Tire & Rubber Co., Akron, O.

The meeting was sponsored by the Rubber & Plastics Division of the Metropolitan Section of the Society of Mechanical Engineers. Invitations were also extended to members of the Metropolitan Section and of the New York Rubber Group. Felix Yerzley, who presided, in introducing the speaker, also touched briefly on the history of rubber in automobiles.

Whitby Discusses Isoprene

ISOPRENE, a rather simple, unsaturated compound of carbon and hydrogen and one of the resulting products when rubber or turpentine is broken down by heat, is a chemical unit on which nature builds such vastly different substances as certain vitamins, the chlorophyll of green plants, sex hormones, and essential oils of turpentine and eucalyptus, according to Prof. George S. Whitby, of the University of Akron, speaking before the Cleveland Section of the American Chemical Society on February 21.

Isoprene, as such, is not known to occur in nature, he said, but isoprene units in combination are the basis of many varied classes of substances built up by nature, sometimes by extremely subtle changes in molecular architecture. The rubber molecule contains several thousand isoprene units, Dr. Whitby said, but apparently it is formed in a manner fundamentally different from other isoprenoid substances in nature.

"It is plausible to regard the latter, containing at most eight isoprene units, as being fundamentally built up by stepwise addition, but it is difficult to credit the formation of the rubber molecule to stepwise addition. It seems more likely that it is formed by the actual high-molecular polymerization of isoprene, perhaps in an activated or nascent condition."

Compounds containing two isoprene units, such as terpene essential oils; those containing three isoprene units, including nerolidol from orange blossoms; the chlorophyll of the green leaf having four isoprene units, a part of which molecule also is present in Vitamins E and K; and the compounds containing six isoprene units combined in a complicated multicyclic structure, physiologically important substances related to the sterolds, were also discussed at length.

Ontario Rubber Section Meeting

AT THE next meeting of the Ontario Rubber Section, J. G. Mark, of the Dewey & Almy Chemical Co., Cambridge, Mass., will speak on "Tailor-Made Polymers," the same subject discussed at the Montreal Rubber & Plastics Group meeting on January 12. The Ontario meeting, to be held at the Royal York Hotel, Toronto, on March 13, will be preceded by a dinner to be held jointly with other Toronto groups under the auspices of the Chemical Insitute of Canada.

Fungus Growth Preventives

THREE pyridyl mercuric salts, the acetate, chloride, and stearate, have been introduced for use in inhibiting bacterial and fungus growth in tropical regions when employed in Armed Forces equipment (such as rubber and plastic coated fabrics). Pyridyl mercuric acetate and chloride find their greatest use in rubber, synthetic resins, and textiles. The acetate is soluble in water and may be used with wax in addition to the materials mentioned; while the chloride is only slightly soluble in water and may also be applied to cork. The stearate differs from the acetate and chloride in that it is soluble in oil and a variety of other solvents. As a result, it lends itself readily to the treatment of waxes, oils, paints, lacquers, and similar products. Mallinckrodt Chemical Works.

Blank & Stoller

Charles R. Haynes

Charles R. Haynes

Charles Rogerson Haynes, recently elected a director of the Division of Rubber Chemistry of the American Chemical Society, has had a long and varied association with the rubber industry and is widely known in it. His association with the industry began 40 years ago as an employe of the Boston Rubber Shoe Co. From 1907 to 1912 he was with the Boston Woven Hose & Rubber Co. and from 1912 to 1915 assistant superintendent of the Mechanical Rubber Co., Cleveland, O. The following four years Mr. Haynes was superintendent of the Goodyear Metallic Rubber Shoe Co., Naugatuck, Conn., and in 1919 he became technical director of the footwear factories of the United States Rubber Co. In 1928 he was named factory manager of the Boston Rubber Shoe Co. When the plant was shut down in 1930, he became assistant purchasing agent for U. S. Rubber, and two years later was transferred to the Naugatuck Chemical-Latex Division of that company. Mr. Haynes, in 1935, joined the Binney & Smith Co. as manager of rubber service.

Born in Dedham, Mass., July 18, 1882, he attended Hyde Park High School, Boston, Mass., and the Massachusetts Institute of Technology. From the latter he was graduated in 1904 in chemical engineering. Mr. Haynes is a member of the Masonic Lodge and of several subcommittees of the American Society for Testing Materials.

He is married and lives at 405 E. 54 St., New York, N. Y., and maintains a summer home at Carter Hill, Clinton, Mass. His recreational interests include sailing and golf.

Mr. Haynes has served as chairman for the membership committee of the Division of Rubber Chemistry since 1939 and was chairman of the New York Group in 1940.

Kyrides to Receive Midwest Award

LUCAS P. KYRIDES, research director of Monsanto Chemical Co.'s organic chemicals division and one of America's leading scientists, will be the first recipient of the Midwest Award of the American Chemical Society at a dinner at the Hotel Coronado, St. Louis, Mo., March 5, to be held under the auspices of the St. Louis Section of the Society. Dr. Kyrides will be the principal speaker and will outline advances which have taken place in chemistry within the span of his own career.

The award, a gold medallion, is to be given each year by the St. Louis Section to the individual adjudged most outstanding in the point of "meritorious contribution to advancement of pure or applied chemistry or chemical education." Eligible for the honor are chemists residing in Missouri, Kansas, Iowa, Oklahoma, Nebraska, Arkansas, Kentucky, Tennessee, and Illinois.

Dr. Kyrides was one of the pioneers in the development of synthetic rubbers, having been one of the workers at the Hood Rubber Co. in 1910-13, who first perceived the possibilities of isoprene, butadiene, and dimethyl butadiene as the most promising monomers for the production of substitute rubbers. Ascribed to him at that time is a quotation which has been confirmed on very large scale during the past few years:

"The problem will eventually be solved, although it will require a good many years of earnest and patient study. The starting point of these syntheses will most probably be alcohol, which can be produced fairly cheaply."

The original patents were assigned to the Hood company, and their validity was hotly contested by German interests, but Hood won an interference test filed by the Germans, and won it on every point at issue. Dr. Kyrides will sign his hundredth patent application shortly before or after becoming the Midwest medalist. Of these patents, about 60 have been assigned to the Monsanto company, with which he has been associated since 1928.

At Monsanto he has made significant contributions to synthetic vanillin, plasticizers, sulpha drugs, and "soapless soap," as well as scores of little known industrial chemicals that are vital to the nation's peacetime or wartime economy.

Properties of Synthetic Rubber

P. J. FLORY, of Goodyear Tire & Rubber Co., Akron, O., addressed a meeting of the Southeastern Pennsylvania Section of the American Chemical Society on February 22. The gist of his address was the properties of synthetic rubber. Out of the numerous types of synthetic rubber there are only a few whose uses warrant their manufacture. There is a varied composition of these rubber-like materials. One thing in common that these rubbers have is their similarity in chemical structure; all have long thread-like molecules similar to those found in plastics, silk, and cotton.

The rubber properties are influenced by the lengths of these molecules. They should be long for high strength, but not long enough to cause difficulties in milling, molding, and fabricating into tires. Uniformity of lengths is another desirable quality. Therefore the chemist must construct molecules of just the right composition and length. The number of cross-links between the thread-like molecules has a direct bearing on the stiffness or flexibility of the rubber; the greater the number of these cross-links, the stiffer the rubber. These cross-link numbers also influence the interaction of rubber with solvents.

The meeting was presided over by Paul O. Powers, chairman of the Southeastern Pennsylvania Section.

UNITED STATES

WPB Tire Plant Details Revealed; International Meeting Stresses Post Postwar Rubber Surplus

More detailed information on the extent and location of the WPB tire plants was made public during February. Funds totaling more than $60,000,000 have now been allocated by the Defense Plants Corp. for the construction of these plants, in various localities from Connecticut to Texas to California. The seven-day week has boosted tire production figures, and the morale among tire workers has improved considerably. This latter is attributed to the contact of the civilian workers with the furloughed former tire builders returned from military service, who realizing the urgency of the military tire demand, are letting nothing prevent them from turning out the maximum production day after day. Material shortages, particularly carbon black, are becoming increasingly difficult in the stepped-up program, and 10,000,000 pounds a month of this ingredient have been taken away from the producers of everything but the most essential military tire products. An excellent report on tire production figures since Pearl Harbor was made public by the Rubber Manufacturers Association, Inc. The international rubber conference in Washington apparently adjourned with the decision to "wait and see" a while longer before trying to formulate even a semi-official plan to handle the problem of the post postwar surplus of natural and synthetic rubbers. The tire program faced a difficult manpower situation with the issuance of a Selective Service order denying deferrment for more than 30% of the men in the 18-29-year age group classified as 1-A up to January 1, 1945.

WPB Tire Plant Program

The WPB Rubber Bureau, the Reconstruction Finance Corp., and some of the various companies who will operate the plants have released more information on the new truck tire facilities for which funds have been authorized by DPC. Some of the projects are part of the so-called "within-walls" program which had been planned prior to the recent six-million-truck-tire-a-year expansion program. This latter will cost around $70,000,000 and will add roughly 25% to the nation's total tire production capacity. In many cases funds thus authorized are not the total estimated expenditure, but rather a partial authorization made so that orders may be placed promptly for certain urgent items of equipment in order not to delay initial operations, WPB said.

The plants for which DPC has allocated funds are:

Goodyear Tire & Rubber Co., Gadsen, Ala.: A partial authorization of funds of $2,000,000, for new buildings adjacent to present factory and for additional facilities, as part of the six-million-tire-a-year program, was reported. Goodyear's vice president, Cliff Slusser, announced from Akron that the Gadsen plant will have a new wing, corresponding to a recently completed tire production wing. This new military tire production unit will add 800 tires and tubes to the daily output of the factory. The wing, 560 by 250 feet, part of which includes a 150-foot mezzanine floor section, will add 300 persons to the Gadsen payroll. Preliminary estimate by the WPB of the maximum yearly production from this new unit is for 288,000 truck tires and 288,000 tubes. Initial production is expected to start by June, 1945.

Goodyear Tire & Rubber Co., Topeka, Kan.: A total expenditure of $4,250,000 is estimated for this new expansion program for new buildings adjacent to the present factory and for additional facilities. As part of the six-million-tire-a-year program, a maximum yearly production of 373,700 truck tires and 373,700 tubes is planned, with initial production scheduled for August, 1945. The tire factory at Topeka originated in June, 1944, as part of the high-flotation tire program. DPC funds to be used in this entire project now total $10,400,000.

The B. F. Goodrich Co., Tuscaloosa, Ala.: Total estimated expenditure for this new factory will be about $18,000,000. A maximum yearly production of 600,000 truck tires, 300,000 tubes, and 600,000 flaps starting September, 1945, is contemplated, as part of the six-million-tire-a-year program. The main factory building will be 1,200 feet long and 300 feet wide and will employ between 1,200 and 1,500 people, according to the Goodrich company.

Goodyear Tire & Rubber Co., Nashville, Tenn.: Total estimated expenditure of $10,000,000 for the six-million-tire-a-year program for a new factory with a yearly production of 370,000 truck tires, 370,000 tubes, 1,440,000 flaps, and 360,000 bogies was announced. Initial production date is given as August, 1945.

Firestone Tire & Rubber Co., Pottstown, Pa.: A partial authorization of funds of $7,000,000 was announced. This will be a new factory insofar as tire building is concerned. Title to land and buildings is already vested in DPC. The plant was formerly operated by Jacobs Aircraft Co. for the Army Air Forces. Maximum yearly production, starting April, 1945, as part of the six-million-tire-a-year program is estimated at 900,000 truck tires, 2,160,000 tubes, 1,800,000 flaps, 300,000 bogies, and 300,000 airbags.

Firestone Tire & Rubber Co., Memphis, Tenn.: Total estimated expenditure is given as $250,000 for additional facilities, as part of the "within-walls" program. A maximum yearly production of 28,000 truck tires beginning May, 1945, is expected.

Firestone Tire & Rubber Co., Akron, O.: A partial authorization of funds of $1,000,000 for additional facilities to have a maximum yearly production of 180,000 truck tires, starting May, 1945, as part of the "within-walls" program, was revealed.

Dayton Rubber Mfg. Co., Dayton, O.: A partial authorization of funds of $400,000 for buildings, wings, and additional facilities, as part of the six-million-tire-a-year program, was announced. Maximum yearly production of 150,000 truck tires, and 150,000 tubes, starting May, 1945, is expected.

Goodyear Tire & Rubber Co., Akron, O.: An approximate total expenditure of $500,000 for additional facilities, as part of the "within-walls" program, was listed. A maximum yearly production of 144,000 truck tires is anticipated.

Lee Tire & Rubber Co., Conshohocken, Pa.: A partial authorization of funds of $600,000 for building additions, wings, and extra facilities, as part of the "within-walls" program, was announced. A maximum yearly production of 136,000 truck tires and 120,000 tubes, starting June, 1945, is expected.

Lake Shore Tire & Rubber Co., Des Moines, Iowa: A partial authorization of funds of $775,000 for building additions, wings, and extra facilities, as part of the "within-walls" program, was reported. An estimate of a maximum yearly production of 596,000 truck tires, starting May, 1945, was given.

Kelly-Springfield Tire Co., Houston, Tex.: A total expenditure of $6,000,000 for a completely new factory, as part of the six-million-tire-a-year program, was announced. No production figures were given, but it is understood that this new factory will take the place of new tire production facilities previously contemplated by this company for Cumberland, Md.

Goodyear Tire & Rubber Co., Gadsen.: A second project to cost $225,000 for additional machinery as part of the "within-walls" program besides the previously announced $2,000,000 authorization of funds was also revealed for this company. It was stated that the $225,000 was included in the original $2,000,000 authorization and that this phase of the program would produce at a rate of 252,000 truck tires a year, beginning April, 1945.

Pacific Tire & Rubber Co., Oakland, Calif.: The partial authorization of $1,000,000, as announced by DPC, was for new additions, wings, and extra equipment that will eventually add an estimated 216,000 truck tires annually to the nation's output. Initial production from the new facilities will begin in May, 1945.

Textile Rubber, Inc., Bowdon, Ga.: The expenditure of $250,000 approximates the total outlay planned for this project. New wings and additional manufacturing facilities are to be provided for making flaps and airbags, at the rate of 1,000,000 units a year. Initial production is expected by April, 1945, but the Rubber Bureau said that the Georgia project is still undergoing technical studies that may alter plans for carrying the improvements described.

Pharis Tire & Rubber Co., Newark, O.: A partial authorization of funds of $1,000,000 to acquire additional machinery and equipment as part of the "within-walls" program was announced. A maximum yearly production of 180,000 truck tires is anticipated, with initial production getting under way in August, 1945, according to the WPB. Furber Marshall, Pharis president, in a separate announcement estimated that the total cost of the new plant would be about $2,250,000. The new two-story structure will be approximately 250 by 200 feet, of brick, steel, and concrete. Floor space will total 100,000 square feet, as compared with 130,000 square feet in the present Pharis Plant No. 1. Mr. Marshall pointed out that, while the government holds title to the plant and equipment, arrangements have been made whereby Pharis will be given the opportunity to purchase them after the war.

Armstrong Rubber Co., West Haven, Conn.: A partial authorization of funds of $2,000,000 for erecting a new building and securing additional machinery and equipment, as part of the six-million-tire-a-year program, was announced. Preliminary production estimates call for 180,000 truck

tires a year from the new improvements, with initial production scheduled for July, 1945.

Inland Rubber Co., Ottawa, Ill.: A total expenditure of about $7,000,000 for the building of a new plant, as part of the six-million-tire-a-year program, was authorized. The plant will provide a maximum yearly output of 360,000 tires and 360,000 flaps, with initial production scheduled for about August. Wm. M. Collins, Jr., president of Inland, in a separate statement revealed that the plant will be built on a 100-acre tract adjacent the Ottawa city limits and that his company expects to employ between 600 and 800 workers when the plant is in full operation.

Master Tire & Rubber Co., Findlay, O.: A partial authorization of funds of $600,000 for additional machinery and equipment was reported. Maximum yearly production is estimated at 93,800 truck tires, with initial production scheduled for September, 1945.

The B. F. Goodrich Co., Akron: A partial authorization of funds of $300,000 is for additional machinery and equipment for the maximum yearly production of 67,000 bogie tires, beginning September, 1945. This outlay is classified as a "special project" since it will expand the production of bogie tires only.

Pennsylvania Rubber Co., Jeannette Pa.; A partial authorization of funds of $300,000 is for additional machinery and equipment expected to result in a maximum yearly production of 151,500 truck tires and 26,800 tubes. Initial production is scheduled for July, 1945.

Frank Schenuit, Inc., Baltimore, Md.: A partial authorization of funds of $30,000 for a new factory for the production of 12,000 airplane tires and 40,000 airplane tubes, also is classed as a "special project" because the company makes only airplane tires and tubes, which have priority over the manufacture of all other tires and tubes, according to the WPB. Initial production is set for April, 1945.

United States Rubber Co., Eau Claire, Wis.: DPC late in February authorized the expenditure of $1,500,000 in government funds for additional machinery and equipment at this Gillette plant of the company. This $1,500,000 is a part of a total government expenditure of over $4,000,000 contemplated for this plant.

Norwalk Tire & Rubber Co., Norwalk, Conn.: J. W. Whitehead, company president, stated that DPC expected to approve early in March the expenditure of $1,200,000 for a new four-story building, fully equipped to manufacture about 500 tires and tubes a day as an addition to the facilities of this company.

In connection with the government's tire program, James F. Clark, director of the Rubber Bureau, called attention to the fact that it has been possible to locate the majority of the new truck tire projects adjacent to present tire factories. In a few instances production of articles other than tires has been shifted to other locations in order to expand tire production at so-called "company headquarters." While quick production has been the major consideration in approving each new project, availability of manpower has been cleared with the War Manpower Commission before approval of each case, he said.

The WPB on February 26 announced that the production of truck and bus tires for January was 30% above that for December and 13% above the production scheduled for January. Just what the actual figures were for either month was not announced.

The Manpower Problem

Mr. Clark in a statement early in February said that as a result of the drive to obtain sufficient manpower for peak operation of all facilities, at present producing truck and bus tires, a net gain of 3,614 workers has been achieved since last November.

"On November 25, 1944, 5,936 additional employes still were needed to man all existing facilities on a three-shift basis. Five thousand of these workers had to be men capable of performing heavy and strenuous work. As of January 20, 1945, the total needs for additional manpower had been reduced to 2,322 employes; some 1,450 men and 872 women still being needed. These figures show a net gain in employment of 3,614, but 1,500 of this net gain is represented by soldiers furloughed for 90 days by the Army. These furloughs will have to be extended, or the drive must be continued to hire men to take their places, if we are to maintain the desired production rate of essential truck tires," Mr. Clark declared.

It was also stated that during the nine-week period from November 18, 1944, to January 20, 1945, truck and bus tire output showed an increase commensurate with the rise in manpower and a marked decrease in absenteeism from 12% in some factories in November to 6% in January. Credit for securing the gain in employment was ascribed to good teamwork between the WMC, the WPB field offices, the U. S. Employment Service, the War Department, the Navy Department, and the WPB Rubber Bureau. The heavy-duty tire production team of the Army Service Forces has also been most helpful and has assigned a representative of this team to each tire manufacturing company. Recent reports indicate that the Navy Department is taking steps to furlough about 150 sailors not now assigned to the fleet or who have not been specially trained by the Navy, but who have had previous experience in heavy-duty tire building. Mr. Clark added, and in conclusion pointed out that today's figures are the current needs including the men and women who will have to be hired to man additional facilities in the "within-walls" tire expansion program, but did not include those for the six-million-tire-a-year program.

A group of nine tire workers returned from a specially arranged tour of the European battlefronts during February and reported to Undersecretary of War Patterson that they were "inspired beyond expression" by what they saw, and that they were returning to their jobs "more determined than ever that what the Armed Forces want and need they will get insofar as it is in our power to produce." The nine are: George R. Bass, Francis M. Hannley, Howard R. Lloyd, Wm. A. Nelson, Wm. D. Richards, Freeman V. Van Houtan, and Clarence V. Wheeler, all of Akron; Albert T. Lunceford, of Los Angeles, Calif., and John F. Marmon, of Detroit, Mich. The group also made public the following message to all American war workers:

"The nine of us were signally honored with an invitation from the War Department to visit the European theater of operations. It is the first time on record that a group of workers in any industry has been so honored.

"We have just returned from that visit. What we have seen and heard convinces us beyond any doubt that the men charged with running this war are doing a magnificent job and that we can have complete confidence in their integrity, their sincerity, and their ability to bring us certain victory.

"We were much impressed with the seriousness and effectiveness of the salvage and conservation programs being carried on overseas—right up where the actual fighting is going on. To be sure war is waste, but certainly our men over there are everlastingly on the job to reduce that waste to a minimum. What they do to restore junk and scrap to effective use made us feel a bit ashamed of our carelessness at home.

"We are tire men, and work and live with men and women who produce tires and tubes. We can truthfully say that no other item gets more serious consideration over there than tires and tubes wherever you go. Our men over there need every tire and tube that can possibly be produced. The evidences of short supply in some cases are nothing short of tragic. It is our firm resolve to see to it that this threat to the Army procurement program is removed forthwith. That is the least we can do for all these men who are doing so much for each one of us.

"We return to our homes with nothing but praise for the superb job being done over there. We are prouder than ever that we are Americans. What we have seen convinces us that the millions of workers here have done an outstanding job. We know the tire workers well enough to say that nothing will deter them from doing even a better job and thus insure a speedy and lasting peace."

Unfortunately two strikes during February, one at the United States Rubber Co. plant in Detroit and one at the plant of the Enka Corp. in Asheville, N. C., were reducing this essential tire production at about the same time the union tire workers were reporting on their visit to the fighting zone. The Detroit stoppage involved 180 women band builders who were protesting wage rates and caused the temporary layoff of builders of large-size military tires. Union officials were trying to persuade the women to resume work. The first of the 3,000 striking members of the AFL United Textile Workers returned to their jobs at the Enka rayon plant in Asheville on February 18, after the War Department took over operation of the plant under authorization of President Roosevelt. The walkout cost more than a million pounds of high-tenacity cord rayon production for military tire fabric, which is already dangerously behind requirements.

R. M. A. Tire Production Figures

The Rubber Manufacturers Association on February 14 revealed that more than 40 million heavy-duty truck tires have been produced since Pearl Harbor, even though we lost 90% of our source of supply of natural rubber at about that time. Tires for airplanes rose from 33,000 in 1939 to 1,417,000 in 1944. All this was accomplished even though it takes considerably more milling time in preparing stock for the manufacture of synthetic rubber tires, and in addition a single heavy-duty military tire may take 20 times more rubber than a popular-size passenger-car tire. The tire industry's figures show that production of passenger-car tires, which had dropped from 50 million in 1941 to 2½ million in 1942, was increased substantially during 1944. Third-quarter production was 4,909,000 tires, about a million more than in the second quarter, but new war demands for truck tires have thrown passenger-car tire production temporarily into reverse.

"These facts about tire production to date

give perspective to the challenge which the industry faces today," according to A. L. Viles, president of the Association. "The War Department asked tire manufacturers last December to increase the production of heavy-duty truck tires by 75%. They have accepted this challenge, regardless of cost or effort, and are well on the way to meet it. Part of the challenge is to the public, however; a challenge to make their present passenger-car tires last, through careful driving and recapping while the industry concentrates on meeting these new military demands."

Figures on the production of "camelback" show a fourfold increase between 1941 and 1944. Figures for the first quarter of 1942 show 43,631,000 pounds of cotton and 5,936,000 pounds of rayon used in tire production; while in the third quarter of 1944, 45,240,000 pounds of cotton and 19,492,000 pounds of rayon were used. Other information describing the conversion from natural to synthetic rubber and the change in the stocks of rubber in this country from 1939 to date are all included in the form of a very well-done bulletin entitled "Tires at War."

It is also explained that though it now costs 33% more to make and deliver passenger-car tires from synthetic rubber, OPA has established price ceilings which set the list price on synthetic rubber passenger-car tires at less than 9% above prewar prices for crude rubber tires. On synthetic rubber truck tires, which now cost about 25% more to make and deliver, retail list prices were frozen in May, 1944, at the same levels as prewar crude rubber tires.

Carbon Black Use Restricted Further

Mr. Clark, on February 14 announced that not only has a limitation been placed on the total permitted amount of carbon black for each rubber product, but also a special limitation has been imposed concerning the percentage of "channel type" carbon black permitted for each product. These limitations, which went into effect February 15, are prescribed in List 35, Appendix II to Rubber Order R-1. Through the reductions given in this order, approximately 7,500,000 pounds of carbon black a month will be diverted to essential military items at the expense of some less essential items. Future additions to List 35 are under study, to provide an additional saving of 2,500,000 pounds a month for the stepped-up production of tires for the Armed Forces, Mr. Clark added.

Bogie-wheel tires and other rubber-covered wheels for tanks and half-tracks, as well as special puncture-proof combat tires, are excepted from the regulation. The reduction in the amount of carbon black permitted in heavy-duty truck and bus tires, tubes, and tire flaps and in medium-size truck tires will amount to only 5%, but the reduction in carbon black for passenger-car tires and jeeps will be 25%. Camelback will have to contain 10% less carbon black. The amount of carbon black permitted in belting, hose, packing, gaskets, and other mechanical goods will be subject to general reductions, some of which will be large, but for certain items essential to the production and operation of war equipment the reductions will be moderate. Hard rubber products will have to use 20% less, with the exception of conductive hard rubber products, which may consume the same amount of carbon black as before. Waterproof footwear and soles will get 11% less than formerly permitted.

The carbon black conservation program has been carefully studied by the technical consulting committees of the Rubber Bureau, Mr. Clark explained. Where the reduction in carbon black is relatively small, the quality of the end-products will not be appreciably affected, but where the reduction is more severe, quality will suffer in proportion to the curtailment.

The new facilities to produce additional carbon black now being planned and expedited by the WPB Chemicals Bureau are a future answer rather than a help to the shortage which is present today, it was reported. As additional amounts of carbon black become available, every effort will be made to utilize the increased supply in items where quality has been impaired by these conservation measures, but the present restrictions will obviously have to remain in force until the new supply becomes available—possibly late in the spring. The total amount of carbon black allocated for February was approximately 78,000,000 pounds. Allocations for March and April will approximate the quantity allocated for February, barring unforeseen contingencies, the WPB stated on February 19.

Washington International Rubber Conference

An official statement from our Department of State early in February, following the conclusion of the meeting of the International Rubber Study Group in Washington, January 22-27, reported that actual production, if required, of the natural rubber areas of the world could rise three to four years after liberation of the Far Eastern territories to an annual figure of about 1,500,000 tons of rubber. As regards synthetic rubber, while the position in the United States can be predicted with some accuracy, the state of the plants in Europe at the end of the war with Germany is very conjectural, but the Group arrived at a figure of annual world productive capacity of synthetic rubber of approximately 1,333,333 tons. Consumption is not likely to reach a figure of more than 1,500,000 tons annually of all types, even though there at present exists a large banked-up demand all over the world for both rubber itself and rubber goods, it was concluded, since this accumulated demand can be met only gradually.

The representatives emphasized the very great uncertainties which surround any estimates of future capacity both to produce and consume the various types of natural, synthetic, and reclaimed rubber and refused to make any definite estimates on production costs, since these estimates would be purely speculative. The Group paid a warm tribute to the immense achievements of the American synthetic industry during the war, but noted that supplies of natural rubber were likely to remain short for some time. An account was given of the broad lines of the plans being made by the governments concerned, and the plantation industries, for the rehabilitation of the natural rubber growing areas after liberation.

Information from other sources indicated that it was hoped that the Far Eastern plantation areas could be recovered during 1945. Except for jungle growth and lack of proper drainage, it is expected that the trees have not been greatly harmed. The attitude of the governments of these areas, the probable increased cost of living for the natives, the cost of labor, and many other unknowns make impossible much but a guess as to the postwar selling price of natural rubber, but under these conditions it might be assumed that it would be higher than the immediate prewar figure.

The Trade Commissioner for Netherlands India, William P. Hasselman, in a *Newsletter* for February stated that a new government-controlled organization will soon be put in temporary control of the production and trade of rubber in freed parts of the Netherlands Indies. This organization, which will be called the "Rubber Centrale," will be managed by a board of directors representing several N. I. rubber organizations, such as the A.V.R.O.S. (United Rubber Industries, Sumatra's East Coast), Rubberbond (Rubber Association), and Exporteurs-Vereeniging (Exporters Association).

Relief plans are making satisfactory progress. Non-restricted and non-military goods have been purchased and other important items such as boats, barges, trucks, clothing, medical supplies, communication equipment, agricultural implements, etc., are being negotiated for in the United States. An order for 20 ships of about 450 tons each has been placed with a West Coast shipyard. These ships will be used to transport relief supplies in the Indies and after the relief period will be used to transport agricultural produce to the ports of export. All relief purchases have been and will be financed out of Dutch funds, but this government hopes to conclude loans for the reconstruction of the N. I. economy, it was stated. The fundamental principle will be to acquire the means to restore, not normalcy, but a condition where the population can help itself achieve it, Mr. Hasselman's report said.

An Associated Press story on February 11 by Gareth Muchmore, commenting on the success of recent actions in the Pacific, mentioned that while no detailed reports are available on the condition of the rubber plantations in Sumatra and Java and on the Malay peninsula, a trickle of information from underground sources—along with a slim flow of actual rubber into our hands—occasionally reaches this country. Based on these reports, estimates are that the huge plantings of trees in these areas are 80% unspoiled.

The worst problem anticipated by the men who expect natural rubber to recapture much of its prewar market in the tire and other fields is that of personnel. Many plantation staffs were captured by the Japanese, and after more than two years in internment camps they will not be in condition to undertake the task of organizing rubber production, it was pointed out. Native labor crews will have disbanded, and new ones will have to be trained.

Representatives of the British and Dutch governments after their conference with American representatives in Washington visited the GR-S plant operated by United States Rubber Co. at Institute, W. Va., and a similar plant operated by Goodrich at Louisville, Ky., and then spent two days in Akron touring the manufacturing plants of Firestone, Goodrich, General Tire & Rubber Co., Seiberling Rubber Co., Goodyear Aircraft Corp., and the laboratory of Goodyear Tire & Rubber. British representatives included O. S. Franks, chairman of the delegation, British Ministry of Supply; Sir Gerard L. Clauson and E. L. Hall-Patch, assistant undersecretaries of state; Sir John Hay and H. Eric Miller, of the Rubber Growers' Association; Sir Walrond Sinclair, of the Institute of Rubber Manufacturing Industry; F. G. Lee, assistant secretary, United Kingdom Treasury; and A. G. Pawson and W. G. Kellett, of the London rubber secretariat.

In the Dutch delegation were P. W. Westerman, chairman of the delegation, Trade Commissioner for the Netherlands India government; Lieut. Col. J. T.

Cremer, acting member of the Board for Rubber Administration of Sumatra; P. Honig, member of Board for N. E. I.; O. Reuchlin, counselor of the Dutch Embassy at Washington; T. A. Tengwall, of the Board for N. E. I.; and Capt. L. Jiskoot, adviser to the Netherlands India government.

Rubber Bureau Personnel and Operation

Some information on the general operational set-up and responsibility of the WPB Rubber Bureau was obtained during the past month. The government tire expansion program, allocation of rubber and supervision of the allocation of materials for using it, and the supervision of allocation and claiming of manpower for the rubber program are the main activities of this Bureau at present. Technical problems are a minor activity of the Bureau, since most of this is now handled by the Rubber Reserve Co. Equipment for the new tire expansion program is getting top ranking priority assistance from the WPB, but the Rubber Bureau is concerned because it is only a claimant agency for manpower, and manpower is one of the rubber program's biggest worries.

In addition to Mr. Clark, key personnel include Walter J. Sears as deputy director; Ernest P. Kelly, assistant director; George B. Kayser, director of allocations and statistics division; Richard W. Alger, director of facilities and construction division; and Thomas J. Newton, director of technical division.

Mr. Sears was formerly employed by U. S. Rubber in Detroit, Mich., where he was in charge of the tire testing laboratory and then technical representative on the development of fuel cells. He entered the OPM in 1941 and has had various assignments in the WPB, particularly in connection with the CMP Division. His latest work was the basic development of reconversion methods. He has been with the Rubber Bureau since September, 1944.

Mr. Kelly, a construction and plant engineer before entering OPM in September, 1941, also spent considerable time in the CMP Division and also with the Lumber Division. He joined the Rubber Bureau in November, 1944, to work on special problems and was made assistant director in January, 1945.

Mr. Kayser was associated with leading architectural and engineering firms in New York. During World War I, he was an ensign, U.S.N.R.F., and executive officer, production division, Naval Base, New London, Conn., and during the first part of World War II was chief of ports and storage branch, construction division, Corps of Engineers, War Department. Mr. Kayser joined the Office of the Rubber Director in January, 1943, and subsequently became director of allocations and statistics division of the Rubber Bureau.

Mr. Alger, with experience in architecture and engineering, served in the Corps of Engineers and in the Quartermaster Corps during and after the first World War in charge of heavy construction programs. Since October, 1942, he was chief of the Copolymer Section, Plant Construction Division, ORD, and was in charge of the construction of all the copolymer plants. He was assigned to the tire expansion program in 1943 and in October, 1944, became director of facilities and construction division of the Rubber Bureau.

Mr. Newton was associated with U. S. Rubber at Detroit until he entered the Army and Navy Munitions Board, Rubber Conservation Section, in July, 1942. In October, 1942, he became chief, Automotive Products Section, Rubber Branch, Army Service Forces, and in February, 1944, joined the ORD. Mr. Newton was appointed director, technical division, Rubber Bureau, in October, 1944.

Industry to Lose 18-29-Year-Old Workers

The manpower worry became acute late in February when it was reported from Akron that draft boards in that area had been instructed to induct 2,400 men in the 18 to 29 age group from the rubber factories, in accordance with new Selective Service regulations. The same ruling will affect other rubber manufacturing areas. More than half of these men are associated with tire production as chemists, engineers, and technicians, as well as skilled production workers. The new order states that none of the men in the 18 to 29 age group who were reclassified 1-A by January 1 will be deferred. The paradox of this situation is that to combat the manpower shortage in the tire plants the Army recently furloughed 1,500 men to work in these plants. Now 2,400 men must be lost to the industry at the same time that the military is demanding more and more tires and the government is spending $70,000,000 to build new tire plants. Further complications are bound to develop when the second-quarter military quota for tires is finally decided upon since it is understood that this quota will be higher than the figures estimated a few weeks ago. Thirty per cent. of the men in this 18 to 29-year age group will be permitted to seek deferment, according to latest reports. Only a few days later, on February 25, it was announced that the 30-33-year-old age group would also not be granted deferment if they had been classified as 1-A.

Changes in Rubber Order

Further revisions have again been made on R-1. Amendment 2 to Appendix II, as Amended November 9, 1944, in a move to curtail consumption of carbon black adds to Appendix II, List 35 which governs regulations for the use of carbon black in the manufacture of rubber or synthetic rubber products.

Direction 1 to Appendix IV, also issued February 10, provides that whenever any producer has open capacity for tire production, WPB may authorize him to accept certified orders from vehicle manufacturers or orders from Claimant Agencies. Besides authorizations may be issued to accept orders for indirect military replacements in excess of percentages prescribed by directives previously issued under paragraph (e) of Appendix IV.

Additional steps to channel available supplies of rayon tire cord into production of the most critical types of heavy-duty tires were announced February 10 by the Rubber Bureau. The conservation measures will make available considerable quantities of rayon cord for increased schedules for airplane tires and heavy truck and bus tires. The new diversion of rayon tire cord was put into effect by revision of List 32 of R-1, effective February 15. List 32 sets forth types of tires that have first call on available supplies of rayon tire cord. The revised List 32 supersedes Direction 5 of R-1, which was revoked February 15. Direction 5 was issued on December 13, 1944, to effect temporary revisions in the preference pattern set forth in List 32.

Rayon tire cord may not be used hereafter in the manufacture of small truck tires, 7.50 8-ply, standard highway type. This tire group includes rim diameters of 20, 18, 17, and 16 inches. The same prohibition also applies to mud-snow-tread military tires, sizes 7.50 by 20 (8-ply) and 9.00 by 16 (8-ply). Future fabrication of these types will utilize cotton tire cord in place of the prohibited rayon cord. A further prohibition prevents use of new rayon cord in the manufacture of tire repair materials. But no restriction is imposed on the use of scrap materials left over during the manufacture of tires made with rayon cord.

The carbon black shortage, according to the WPB, necessitates postponing indefinitely making Grade A camelback for recapping passenger-car and small truck tires. Consequently Direction 9 to R-1, with the original date for lifting restrictions on Grade A output at April 1, has been revised to continue production of Grade C camelback instead of the prohibited Grade A. Grade C, which uses about 30% reclaimed rubber, will probably contain even more reclaim, says the WPB Rubber Bureau, because of the recent order ruling that camelback be made with 10% less carbon black than heretofore.

The Rubber Bureau further reported that as an additional conservation measure the Armed Forces will recap smaller sizes of military tires with Grade C camelback.

Permission to manufacture items of farm equipment requiring rubber tires mounted on wheel rims of specified sizes does not include permission to use automotive-type tires, WPB stated on February 13. Order L-257 prohibits manufacture of farm equipment requiring rubber tires, with certain exceptions. One of these is items requiring tires to be mounted on wheel rims 15, 16, 18, 20, and 21 inches in diameter. Amendment 4 to L-257, issued February 13, states that producers may not acquire automotive-type tires for the purpose of mounting them on such items and may not use automotive-type tires for this purpose unless they were in inventory or in transit on or before January 16, 1945.

An amendment to General Scheduling Order M-293 adds military truck tire chains and parts to Table 12 as undesignated products subject to the scheduling treatment of M-293 under jurisdiction of the tools division.

Restrictions covering the use of glassine, greaseproof, and vegetable parchment papers have been simplified and clarified by the January 31 amendment to the Specialty Paper Conservation Order M-286. Glassine paper may now be used as a substitute for Holland cloth in the backing of retreading stocks for tires, tire reliners, patches, and sandblast stencils, and as a wrapping on friction and rubber tape. Previously only vegetable parchment could be used as a substitute for Holland cloth in the manufacture of rubber products.

The following chemicals have been added to General Preference Order M-340 as Amended February 6, 1945—Miscellaneous Chemicals: gum and wood rosin and nitrocellulose plastics.

M-383 has ben revoked, and yellow iron oxide placed under General Allocation Order M-300. Ethyl alcohol also was added to the order, effective March 1.

Chemical Service Co. has moved its offices to 82 Beaver St., New York 5, N. Y.

Rubber Reserve Co., Washington, D. C., will construct a refinery building at 20,421 S. Vermont Ave., San Pedro, Calif., at a cost of $135,900.

OPA Again Revises Prices and Rationing Regulations

Adjustable pricing for most sales of cotton tire cord and cotton tire cord fabric by "independent" manufacturers to rubber tire manufacturers was authorized by OPA, pending action upon the industry's request for higher ceilings. (Order 48 under Section 1499.19a of General Maximum Price Regulation—Adjustable Pricing for Cotton Tire Cord and Cotton Tire Cord Fabric Produced by "Independent" Cotton Tire Cord Manufacturers — effective February 5.) This order is intended to allow continued deliveries of these essential goods while OPA is studying the request for price adjustments. Some price revisions may be warranted, OPA said, but they will require further consideration.

The action does not apply to sales of tire cord or fabric for tires bought by war procurement agencies. These products are covered not by GMPR, but by a separate regulation on textiles for military purposes. A producer who can ascertain that the tire cord or fabric is to be bought ultimately by a war agency may apply to OPA for permission to enter into contracts with adjustable pricing clauses.

The application for price adjustments was made through the industry advisory committee representing "independent" cotton tire cord manufacturers. Order 48 applies only to "independent" producers, as distinguished from subsidiaries or affiliates of rubber tire manufacturers. If any price increases are granted, the order permits "independent" manufacturers to charge the difference between present and the revised prices.

Further orders have again been added to MPR 528—Tires, Tubes, Recapping, and Repairing. Order 28 revokes Order 19 and also sets retail ceilings for Waber Special Purpose tubes, products of The Waber Co., 1120 S. Michigan Ave., Chicago, Ill., while the next order does likewise for a 7.50-16, four-ply mud and snow truck tire made by The Pharis Tire & Rubber Co., Newark, O. Order 30 establishes maximum retail prices for certain synthetic LifeGuard special-purpose tubes, products of the Goodyear Tire & Rubber Co., Akron, O. No. 31 gives the retail ceiling for a new size of "Industro" solid industrial tire and retread manufactured by the United States Rubber Co., New York, N. Y.

Amendment 41 to MPR 288, effective February 7, lists retail ceilings for new synthetic rubber tires and inner tubes sold in the Territory of Alaska.

Amendment 2, RO 1D—Tires, Tubes, Recapping, and Camelback in Canal Zone—effective February 1, among other changes deletes references to recapping in the text of the order.

A further cut in passenger-car tire quotas was ordered for February. The quota, as determined by the WPB Rubber Bureau and given to OPA for rationing, was 1,600,000 including motorcycle tires, the lowest since October, 1944. Following is a tabulation of the February quotas and reserves by tire types. January figures are also shown for purposes of comparison.

Type of Tire	February Quotas Allocated	Reserves	Total	January Quotas
Passenger & Motorcycle				
Grade I (new tires)	1,485,000	115,000	1,600,000	1,800,000
Truck and Bus				
Size 7.50 and smaller	203,040	12,960	216,000	216,000
8.25 and larger	91,120	19,080	110,200	110,200
Tractor-Implement				
Size 7.50 and smaller	36,800	13,200	50,000	50,000
Larger than 7.50	16,560	4,440	21,000	20,000

The first meeting of the Tire & Tube Repair Material Industry Advisory Committee was held in Chicago on January 29 and 30. Problems relating to price controls on camelback, tire and tube patches, tube repair kits, and airbags and steambags were discussed by the committee with OPA representatives. OPA was represented by H. H. Hover, Graydon Swan, George Abrams, and A. F. Schalk, Jr. E. C. Leach, of General Tire & Rubber Co. was elected chairman of the committee; G. E. Oliver, of Oliver Tire & Rubber Co., vice chairman; and John Wolfe, assistant secretary of The Rubber Manufacturers Association, Inc.

A major topic of discussion at the meeting was airplane camelback, particularly in the smaller gauges, 6/32 and 8/32. The committee believed that ceilings on these items should be reviewed, but the discussion was limited because of the newness of the commodity and the meagerness of the data available. It was agreed that a further study of this subject be undertaken. Also considered were price ceilings on sales of different grades of camelback and the probable effect of the recent WPB order requiring Grade C camelback for passenger-tire recapping.

Two minor amendments to RMPR 131 were proposed by OPA. The first amendment would permit manufacturers to apply under Section 5 instead of Section 6 of the regulation for maximum prices of new sizes added to an established line of products. The effect of this amendment would be to eliminate the requirement of submitting cost data in an application of this type. The committee approved of this amendment. The second amendment pertains to the pricing of scrap camelback and repair materials. Discussion indicated that further study of the subject was necessary. It was decided to introduce the matter for discussion at the next meeting of RMA industry representatives. With respect to the other items now covered by Sections 5 and 6 of RMPR 131, as tire patches made from new materials, airbags, and tube repair kits, the committee recommended that OPA continue to collect information with a view toward establishing dollar-and-cent prices or simplifying the present formula for finding ceiling prices on new items.

Ceiling prices for used Navy Class B tires sold by the Treasury's Procurement Division for civilian use are established in Revised Order No. 12 under SO 94, effective February 14. These tires are unfit for military use, but will give limited service on civilian vehicles. No estimate of the number available, however, has been made public. The new ceilings are the same as those recently set for used Army C-1 rubber tires: $30 a ton, f.o.b. shipping point, on sales by Treasury Procurement to manufacturers; and $40 a ton, f.o.b. destination, on sales by manufacturers to tire dealers. Tire manufacturers are expected to resell the tires to dealers, vulcanizers, and recappers for repair and resale to the public. Ceiling prices already established in the retail rubber tire regulation (MPR 528) will apply on sales to consumers.

Order 35, RMPR 143, effective February 16, establishes maximum prices for sale at retail and for wholesale sales by the brand owner of rock service and logger tires, carrying the brand name "Kelly Lug Trac" and manufactured by The Kelly-Springfield Tire Co., Cumberland, Md.

Other Rubber Order Affected

Amendment 18 to MPR 200—Rubber Heels in the Shoe Repair Trade—effective February 14, adds the L and R (STD) brand of The I. T. S. Co. to Section 1315.1405 (a) (1) (iii) of the order.

On February 7 three orders were issued covering the maximum prices of misses' and child's short boots for sale in Alaska: Order 68, Second Rev. Max. Export Price Reg.; Order 3, MPR 132; and Order 2, MPR 194.

Order 28 under GMPR 3 (e), effective February 6, covers maximum prices for sales in bulk in the home replacement trade of four types of black rubber heels bearing the brand name "Daisy" and made by Schacht Rubber Mfg. Co., Huntington, Ind.

Supplementary Service Regulation 47, RMPR 165, effective February 12, treats of ceilings for retail shoe repair services, covering such items as leather, composition, rubber, or fiber soles and heels.

Dollar-and-cent ceilings for Buna S synthetic rubber bands appear in Amendment 18 to MPR 220—Certain Rubber Commodities—effective February 17. The ceilings are at the general levels prevailing during the first quarter of 1942, but lower than the prices of some sellers who raised their prices when production of rubber bands was stopped, and keen demand developed for inventory supplies prior to March, 1942, OPA said. The manufacture of rubber bands has been recently authorized, and ceilings are now established for all sellers. The bands are now being made of Buna S synthetic rubbber.

One table of ceilings is established for manufacturers and wholesalers. It is customary for wholesalers to sell from manufacturers' price lists. Another table of ceilings applies to dealers, including stationery stores and other retailers. The table for manufacturers and wholesalers applies to 17 standard sizes of bands. Simple rules are provided to calculate the ceiling prices for other sizes, using this same table. Different ceilings are listed, depending on volume of purchase. The lowest ceilings are for purchases of 500 pounds and over with highest ceilings set for the smallest volume purchases Seven package sizes are listed. The table for dealers, including retailers, applies to all sizes of bands. The prices depend on size of package and volume of purchase. The dealer ceilings on purchases of one to four pounds range from $1.50 to $2.50 a pound. On purchases of 500 pounds and over the ceilings range from 89¢ to $1.26 a pound. Four package sizes are listed. To take care of small retail sales, provisions are inserted that the ceiling per quarter-pound box is 50¢ when the sale is for less than one pound, and the ceiling per one-ounce box is 20¢ when the sale is for less than one pound.

Representative members of the industry were consulted in the establishment of the new maximum prices.

New surgeons' rubber gloves being sold by the Procurement Division of the Treasury Department for civilian use have been given maximum prices by Order 25 to Supplementary Order 94—Special Maximum Prices for Sales of Surgeons' Rubber Gloves—effective February 9.) The sur-

plus gloves involved were made for the Army Medical Corps. They are being sold for use by medical supply houses and hospitals and for other civilian uses, the Army said, because they might deteriorate if kept too long.

Supplementary Order 94, Order 20, sets ceilings for new rubberized aprons made for the Medical Corps of the U. S. Army as sold by the United States Treasury Department, Procurement Division, and by any subsequent reseller.

Order 22 to SO 94 establishes, effective January 29, maximum prices for sales at wholesale and retail of new and used Army five-man, 1,000-pound capacity life rafts sold by the Treasury Procurement Division.

Shaw Executives Visit U. S.

Ronald O. Shaw, works director, and Fred. Siddall, technical director of Francis Shaw & Co., Ltd., Manchester, England, specialist in rubber plant machinery and equipment, arrived in New York on February 5 to spend several weeks visiting important rubber and machinery centers, including Philadelphia, Boston, Akron, and Detroit. Shaw & Co. represents and has operating agreements with a number of American manufacturers of rubber machinery, and Messrs. Shaw and Siddall will visit them to study any new developments as well as consult with other concerns regarding British representation.

It is Mr. Siddall's first visit to the United States. But Mr. Shaw, who was here about 10 years ago, is much impressed by the smoothness with which most of our facilities operate despite the war, but he noted a much more serious attitude among the business men he contacted than existed on his last visit.

Although the company is, naturally, engaged to a considerable extent in producing war equipment, a very substantial part of its activities is still centered on producing and marketing rubber plant equipment.

United States Treasury Department, Procurement Division, Office of Surplus Property, Washington, D. C., on February 8 announced that the sale of consumers goods in January, mainly surpluses turned over to Treasury by the Army and Navy, totaled $13,264,703.12. Among the sales recorded were: $9,395 worth of inner soles to the United States Rubber Co., Mishawaka, Ind.; fasteners, $6,811, to Crown Fastener Division, Warren, R. I.; adhesive plaster, $5,000, American Red Cross, Washington, D. C.; life rafts, $17,745, Fisk Detroit Tire Co., Detroit, Mich.; cable wrapping rubber tape, $10,342, Perry Schultz Co., Los Angeles, Calif. The Treasury also reported a correction in last month's notice of the sale of 2,168 new and used tires to The B. F. Goodrich Co., Akron, O.; the amount involved was $40,841, not $506,800.

Office of Defense Transportation, Washington, D. C., on February 19 warned that failure of commercial motor vehicle operators to comply with regulations requiring periodic tire inspections will adversely affect the claims of these operators for new tires. Truck, bus, and taxicab operators were also informed that ODT representatives on tire rationing panels are giving close consideration to records of regular tire inspection in making recommendations on applications for new tires.

NEW ENGLAND

Wendell E. Bacon

Hall Appoints New England and Eastern Representative

Wendell E. Bacon, of Palmer, Mass., (Box 328) has been appointed New England and eastern representative for the C. P. Hall Co., Akron, O., according to Charles Hall, company president.

Mr. Bacon brings with him to the chemical supply and manufacturing concern 20 years' experience in the rubber and allied industry. He has served with Firestone Tire & Rubber Co., V. L. Smithers, Inc., C. F. Church division of the American Radiator & Standard Sanitary Corp., and United States Rubber Co. A graduate of the University of Chicago, Mr. Bacon also attended the Aberdeen, S. D., Northern State Teachers' College, the University of Akron, and the Massachusetts Institute of Technology. He served overseas for 18 months during World War I. He is also a member of the American Chemical Society and of the Chemists' Club of New York.

Franklin R. Hoadley

Harry L. Fisher, director of organic research, U. S. Industrial Chemicals, Inc., Stamford, Conn., addressed the South Jersey Section of the American Chemical Society on February 20 on the "Origin and Development of Synthetic Rubbers." Dr. Fisher also spoke before the Philadelphia Organic Chemistry Club on the "Chemistry of Vulcanization" on February 28.

Farrel-Birmingham Buys Atwood

Farrel-Birmingham Co., Inc., Ansonia, Conn., manufacturer of heavy industrial machinery and equipment has purchased The Atwood Machine Co., Stonington, Conn., pioneer manufacturer of textile machinery. This transaction unites two old firms, bringing together nearly two centuries of experience in machine design and construction. Farrel-Birmingham's history dates back to its establishment in Connecticut's Naugatuck Valley in 1836; while the Atwood company was founded in 1852.

Farrel-Birmingham will continue to build Atwood textile machinery at the Stonington plant and will maintain the engineering, production, and sales services of Atwood's organization. W. M. Fraser, formerly vice president, has been made general manager of the Atwood plant. No other changes in the organization are contemplated.

Hoadley Elected President of Farrel-Birmingham

Franklin R. Hoadley, president and treasurer of Atwood Machine for the past eight years, on February 19 succeeded John W. Haddock as president of Farrel-Birmingham. Mr. Hoadley has been associated with the latter firm since his graduation from Yale in 1914. During World War I he served in this country and abroad as a lieutenant in the ordnance department. He returned to Farrel-Birmingham in 1918, became foundry manager in 1919, and in 1930 was elected vice president and a member of the executive committee. He has been a director continuously since 1923. He is also a director of the Southern New England Telephone Co., and of the Manufacturers Association of Connecticut, and a past president of the Gray Iron Founders Society and the National Founders Association. Besides Mr. Hoadley is on the board of managers of the Westerly (R. I.) branch of Industrial Trust Co. and is a member of Governor Baldwin's Reconversion Committee for the State of Connecticut.

Mr. Hoadley will continue general supervision of the Atwood plant, as well as assume general management of the Farrel's other three plants in Ansonia and Derby, Conn., and Buffalo, N. Y.

The War Food Administration, Washington, D. C., to make more malted grain available for production of industrial alcohol for synthetic rubber and other war uses during the next few months, has reduced the quotas of malt available to the United States brewing industry. This action, taken through an amendment to WFO 66, reduces the malt quotas during the period from March 1, 1945, to August 31, 1945.

Acme Tire & Rubber Co. is the firm name under which Louis Schuster is conducting business at 511 E. Washington Blvd., Los Angeles 15, Calif.

EASTERN AND SOUTHERN

Lockwood on Union Pacific Program

Representing the rubber industry as guest speaker on "Your America," the Union Pacific Railroad's Mutual Network program, on February 11, Warren S. Lockwood, executive vice president of The Rubber Manufacturers Association, Inc., 444 Madison Ave., New York, N. Y., stated that Japan's "master minds" miscalculated when they planned to cripple America by seizing 95% of its sources of natural rubber. He told a nation-wide radio audience how the synthetic rubber program, pushed through under tremendous handicaps and pressure of time, has managed to keep the Army, Navy, the Air Forces, Marines, and Medical Services supplied with vital rubber goods.

"Through adoption of the far-reaching and drastic recommendations of Bernard Baruch, we have laid the foundation of a synthetic rubber industry which will forever make America independent of natural rubber importations from the Far East," he predicted.

Mr. Lockwood paid high tribute to W. M. Jeffers, Union Pacific president and former Rubber Director. Because he "bulled through" the rubber program, as set forth in the Baruch Report, synthetic rubber factories now have a total capacity of more than a million tons of rubber a year. In 1944, he said, the 150 leading rubber companies produced more than four billion dollars worth of war material and munitions.

"The rubber industry is making new history every minute. Last fall we were producing heavy-duty truck tires at the rate of 16 million a year. In December, the Army asked us to step it up to an annual rate of 28 million in 1945. It is a challenge such as the industry has never faced before, but it has pledged itself to meet it," Mr. Lockwood said in conclusion.

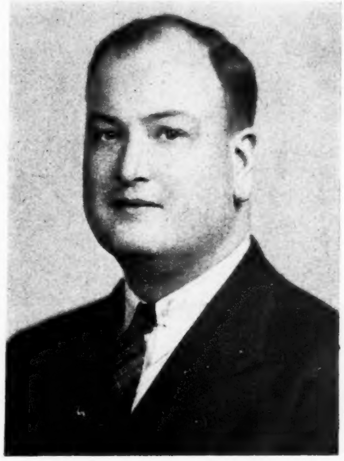
R. M. A. Establishes Information Library

The Rubber Manufacturers Association has established an information library at its offices to aid writers, students, and other individuals looking for information about rubber and the rubber manufacturing industry. The library will include all available non-technical books on the subject of rubber, files of trade publications in this field, catalogs and booklets published by rubber companies, and clippings from newspapers and magazines of articles pertaining to rubber.

Dorothy L. Parker, formerly with the Newark Public Library, has been engaged by the Association as librarian. Miss Parker is a graduate of New York University and the Columbia School of Library Service, and her experience includes work at the Brooklyn Public Library, the Columbia University School of Business Library, the Russell Sage Foundation Library, and the New Hampshire State Library.

A. L. Viles, R.M.A. president, in announcing the new library, stated that "the development of the new synthetic rubber program, the key role which rubber products have played in the war, and the prospect of greatly expanded use of rubber products after the war have created much public interest in the rubber industry, and it is our hope that the new library will be of service not only to the industry itself, but to all who are seeking information on the subject of rubber and rubber manufacturing."

At the same time the R. M. A. announced the addition to its staff of Helen C. Richwine, as assistant to Ross R. Ormsby, secretary of the rubber manufacturing committee. Miss Richwine attended Ohio State University and for the past 2½ years had been associated with the Office of the Rubber Director in Washington.



Ralph B. Appleby

Du Pont Transfers Appleby

E. I. du Pont de Nemours & Co., Inc., rubber chemicals division, Wilmington, Del., has added Ralph B. Appleby, 615 Moreley Ave., Akron, O., to its Akron staff. During the last eight years Mr. Appleby was in the Cleveland office of the du Pont electrochemicals department and was transferred to the rubber chemicals division on January 1, 1945. He will assist H. A. Hoffman, manager of the Akron branch, in technical sales activities of the rubber chemicals division in the Ohio territory. Prior to joining du Pont in 1937, Mr. Appleby was successively connected with The B. F. Goodrich Co., American Cyanamid & Chemical Co., and Thermatomic Carbon Co.

When remodeling and installation work are complete, Mr. Appleby will be located in the new du Pont office and service laboratory building, corner of Buchtel Ave. and South High St. In the meantime he will operate from his home in Akron.

Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh, Pa., Columbia Chemical division, has appointed Walter T. Johnson district sales manager for the division in Chicago. Mr. Johnson, who received his chemical engineering training at the University of Minnesota, has been with the Columbia organization since 1930 and since 1937 was in the Chicago sales office serving as acting district sales manager for the past six months.

H. E. Zoll has been appointed manager of the local Pittsburgh Plate warehouse. He has been with the company 24 years, most recently as assistant manager of the Pittsburgh branch. Mr. Zoll takes the place of H. R. Kluth, recently named general manager of warehouses with headquarters in Pittsburgh.

New Butadiene Production Plant

Dan M. Rugg, vice president of the butadiene division of Koppers Co., Pittsburgh, Pa., has announced that from July, 1943, when production first began, to December 31, 1944, more than 153,000 tons of butadiene were produced through the catalysis of ethyl alcohol at Kobuta, wherein is located one of the three U. S. plants making butadiene for synthetic rubber. Operating a 200-acre plant for the Rubber Reserve Co., the plant is located about 25 miles from Pittsburgh in the Beaver Valley. It was built by the engineering and construction division of the Koppers Co. for the Defense Plant Corp.

Four butadiene units are operating, with a combined annual capacity of 80,000 tons. In January, 1945, the units were operated at better than 160% of rated capacity, because of higher synthetic rubber requirements for butadiene from alcohol.

A 37,500-ton rated styrene production plant is also operated at Kobuta and since initial operation in August, 1943, to December 31, 1944, has produced more than 38,000 tons of styrene.

In August, 1944, when butadiene was being produced at 175% of the rated capacity, synthetic rubber production then equaled and began to exceed the ability of the rubber companies to handle it; and as a result, the government curtailed the production rate until in December, 1944, Kobuta was producing butadiene at 110% capacity rate. Kobuta's production schedule is now back at a maximum as a result of higher butadiene and styrene requirements and improvement in the manpower situation in the rubber processing plants.

Around the clock production is maintained through the utilization of 1,150 employes, of whom 35% are women, working in shifts.

In the past 18 months of production, Mr. Rugg said, about 150,000,000 gallons of 190-proof grain alcohol have been used; the alcohol consumption is 110 tank cars a day at peak production.

By-products, from the oils and gases of butadiene manufacture, such as ether and ethylene gas, are being utilized; the ethylene and ether are both being used to replace the ethyl (grain) alcohol in producing styrene. When these plants are put into operation, nearly 10,000,000 gallons of alcohol will be saved.

With toluene and secondary butyl benzene 50,000-60,000 gallons are now being recovered; the former is used for TNT. and the latter for aviation gasoline. Polyethylbenzene has also been recovered for those companies using the alkylation process as feed stock for producing ethylbenzene. Between June-November, 1944, 16,000,000 pounds of ethylbenzene were produced for aviation gasoline.

Butanol and other chemicals are also being produced, some of the uses are known, and research is being conducted on others. Dicyclopentadiene and xylene, the latter being used as a solvent, are also being produced in small quantities.

The residual by-products, oils and gases after recovery of the chemicals, are being used as fuels in the process furnaces.

Foster D. Snell, Inc., offering every form of chemical service, 305 Washington St., Brooklyn 1, N. Y., has announced that D. Gardner Foulke, recently chief chemist for the Garfield division of Houdaille-Hershey Corp., has joined the Snell staff as director of the analytical department.

U. S. Rubber to Build in Cuba

Plans for immediate construction of a new manufacturing plant to be built near Havana, Cuba, were announced last month by United States Rubber Co., 1230 Sixth Ave., New York 20, N. Y.

"Manufacturing will begin with the production of tire recapping materials and canvas shoes with synthetic rubber soles, commodities which are urgently needed in Cuba," said L. C. Boos, vice president and general manager of United States Rubber Export Co., Ltd. "As conditions permit, plans provide for expansion into other major commodities regularly manufactured by the rubber company.

"Design of the plant conforms with the country's architectural style. Correct lighting, sanitary conditions, and other comforts for the workers, of whom there will be approximately 150, have been given major consideration. Construction contracts have been let to Cuban concerns."

Chittenden and Reynolds Advanced

F. D. Chittenden has been appointed to the newly created position of factory manager, Naugatuck synthetic rubber plant. Previously this plant, operated for Rubber Reserve Co. had been under joint management with the Naugatuck chemical and reclaim plants.

The first position that Dr. Chittenden held with U. S. Rubber was in 1926 as a chemist in the general laboratories, then located in New York, N. Y. He was transferred to the development department of the Providence plant in 1931 and went to Naugatuck in 1942 in connection with the building and operation of the synthetic rubber plant. In 1943, Dr. Chittenden was named chief chemist of the Institute, W. Va., synthetic rubber plant and later became its technical superintendent. He was returned to Naugatuck as a member of the technical coordination staff of the synthetic rubber division in September, 1944.

Dr. Chittenden, born in New Haven, Conn., attended local public schools and Yale University, where he has earned the degrees of B.S. and Ph.D.

Hugh M. Reynolds has been appointed manager of mechanical goods sales of the St. Louis district of U. S. Rubber, replacing H. S. McPherson, now midwestern sales manager. Mr. Reynolds began his rubber career in 1927, serving for the first several years in an export capacity in Australia, India, and New Zealand. Since 1936 he had been manager of mechanical goods sales in the New Orleans, La., district.

Adam G. Grant, of Dothan, Ala., for nine years a salesman at the company's Birmingham branch, succeeds Mr. Reynolds in the New Orleans district.

On February 1 the Fisk tire sales office of the Memphis district moved from Memphis to 1039 Young Street, Dallas, Tex. A. M. Peterson continues as district sales manager in the new location. For the time being, and properly to serve the eastern extremities of the Dallas district, warehouse facilities will be provided by the present branch location at Memphis.

New Modified GR-S Latex

A new modification of GR-S latex, Type 3, has been developed and is in production by U. S. Rubber at the government synthetic latex plant at Naugatuck, Conn., according to J. P. Coe, general manager of the company's Naugatuck chemical and synthetic rubber divisions. Advantages of the new latex are greater uniformity and more easy handling and shipping. It mixes well with other ingredients and is therefore very easily compounded for uniform viscosity and other desired properties. The new latex, furthermore, gives more uniform tensile strength and improvement in other physical properties in most finished products, but much work remains to be done before it is the equal of natural rubber latex in thin-wall dipped goods, it was reported.

The latex is said to have superior properties in saturating paper and fabrics for shoe parts and other artificial leathers; in the backing of pile fabrics for upholstery and carpet manufacturing; and in binding vegetable fibers and animal hair for cushioning of combat tanks, parachute seats and backs and upholstery. Its properties also make it of special value in the solutioning or dipping of tire cord with synthetic rubber latex.

"This development is just one more example of the continuous improvement in synthetic rubber technology which has been accomplished by scientists of the rubber, petroleum, and chemical industries cooperating under supervision of Rubber Reserve Co. in a united war effort. More than one hundred thousand pounds, dry weight, of this latex was produced in its first 60 days of manufacture," Mr. Coe said.

Flintkote Expansion

The acquisition of new plant property, expanded facilities, and an important source of raw material was announced by the Flintkote Co., 30 Rockefeller Plaza, New York 20, N. Y., following the February meeting of its directors. A rubber reclaiming plant of the Raybestos-Manhattan Co., previously operated by its Manhattan Rubber Mfg. Division at Whippany, N. J., has been acquired by Flintkote and "provides greatly needed additional facilities in New Jersey and will permit the relocation of certain operations from our main plant in East Rutherford," according to I. J. Harvey, Jr., Flintkote president.

Simultaneously it was announced that The Tile-Tex Co., national manufacturer and distributer of Tile-Tex floor coverings, had also been purchased by Flintkote, pending approval of the Securities Exchange Commission and the New York Stock Exchange.

A mining property in Canada near Thetford Mines, P. Q., has also been acquired by a newly organized subsidiary of Flintkote Co., Ltd., Canada, known as Flintkote Mines, Ltd. Construction of mining and milling facilities for the production of various grades of asbestos fiber is underway.

It was further reported that The Flintkote Co. (NFLD), Ltd., a subsidiary, has entered into an agreement with the Newfoundland Railway Co. and the Newfoundland Government to supply requirements for creosoted ties and poles under a long-term contract, utilizing wood-impregnating plant facilities nearing completion at Clarendon, Newfoundland.

Herron Bros. & Meyer, 82 Beaver St., New York 5, N. Y., has announced that Clarence B. Moore, formerly technical director of The Thermoid Co., Trenton, N. J., has joined its sales force. Mr. Moore has an experience of 23 years in the rubber industry, having been formerly connected also with the Goodyear Tire & Rubber Co. and The B. F. Goodrich Co., both of Akron, O. Mr. Moore will devote his time to technical sales and product development of rubber compounding materials.

Lee's Annual Meeting

Stockholders of Lee Rubber & Tire Corp., Conshohocken, Pa., at their annual meeting on January 25 elected James Carstairs, Albert A. Garthwaite, Stanton Griffis, Walter R. Herrick, Henry Hopkins, Jr., Ambrose E. Impey, George S. Mahana, Thorpe Nesbit, and Paul Van Anda directors for 1945.

Mr. Garthwaite, president of the company, reported that additions already made and those in process of completion at the Conshohocken plant will increase production approximately 100% over the company's pre-war tonnage. He further said that the Government has also requested that Lee Rubber & Tire participate in a new plant program to alleviate the present truck tire shortage, and that the company will strive in every way to meet its quota of the Army's estimated requirements of 6,000,000 additional truck tires per annum.

General Electric Co., Schenectady, N. Y., last month announced that Philip D. Reed, who until recently was chief of the American Mission for Economic Affairs in London with rank of minister, was reelected a director and chairman of the board of General Electric, a position from which he resigned in January, 1943, and also was elected chairman of the board of the International General Electric Co., a post formerly held by Gerard Swope.

Mr. Swope and Owen D. Young resigned as directors of the International General Electric Co. late in January and had resigned from the General Electric board January 1, 1945.

Associated Rubber Products Co., 1007 Springfield Ave., Irvington 11, N. J., has appointed Technical Director D. E. Henderson general manager of its Quakertown, Pa., plant.

The Okonite Co., Passaic, N. J., has appointed A. L. McNeill manager of the Chicago district; he will direct the company's insulated wire and cable sales in the territory extending from Ohio to the Rocky Mountains. Mr. McNeill, previously manager of the railroad department for this territory, in 1913 had joined the Central Electric Co., Okonite's agent in Chicago, and served as manager of railroad sales until 1925, when he entered the Okonite organization which established its own Chicago District office at that time.

The company also announced that E. H. McNeill, formerly manager of the power and light department has been appointed assistant manager of the Chicago district, and Harry D. Pierce has been made office sales manager. Both A. L. McNeill and E. H. McNeill will retain their active interest in working with the railroads and public utilities.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has established a New England district of its lamp division's field organization and appointed George H. MacGilvray district manager, who will continue to supervise customer relations in New England from his former headquarters at 10 High St., Boston, Mass. The company has also taken over new warehouse facilities at 145 Ipswich St., Boston.

Westinghouse Electric has also announced the election to the board of Gwilym A. Price, vice president, and John R. Read, chairman and president of the Canadian Westinghouse Co.

Hercules Powder Co., Wilmington, Del., has announced the retirement of two of its directors and members of the finance committee, Charles C. Hoopes and George M. Norman, both of whom have been with the company since it started 32 years ago. Their successors on the board are Ralph B. McKinney, general manager of the paper makers' chemical department, and Wyly M. Billing, general manager of the synthetics department.

The Mathieson Alkali Works, 60 E. 42nd St., New York 17, N. Y., has appointed Howard A. Sommers chief engineer, with headquarters in New York. Mr. Sommers joined the Mathieson organization in 1925, several years after he was graduated from Case School of Applied Science.

Princeton University, Princeton, N. J., as soon as conditions permit, will erect a $3,500,000 building to house its library and to provide conference rooms, administrative headquarters, and individual studies for teachers and students in the humanities and social sciences. This building will be named "The Harvey S. Firestone Memorial Library." The family of the late tire magnate, including his five sons, all of whom are Princeton graduates, has made a major gift of $1,000,000 to the fund for the erection of the structure.

The C. J. Tagliabue Mfg. Co., a pioneer in the manufacture of industrial control and laboratory instruments, Park and Nostrand Aves., Brooklyn 5, N. Y., has sold its assets, including good will, name, and patents, to the Portable Products Corp., Pittsburgh, Pa. The business will be operated as a separate division of the Portable Products Corp.

The Manhattan Rubber Mfg. Division, Raybestos-Manhattan, Inc., Passaic, N. J., honored its first two 50-year plant employes, Andrew N. Van Riper and Morris G. Fitts, at a dinner January 25 attended by about 500 persons. This affair also marked the organization of the Manhattan Pioneers, composed of Manhattan Rubber workers who have been with the company at least a quarter-century. Three executives also have completed 50 years with the company: F. L. Curtis, vice president and treasurer of the company, Charles E. Cummings, assistant secretary, and Charles H. Kuhn, of the New York sales force.

MIDWEST

Hall Expands Facilities

It was announced early in February that a new plant for the C. P. Hall Co. of Illinois, to provide new facilities with additional processing capacity and greatly increased distribution means, is being constructed in a manufacturing suburb of Chicago adjoining its southwest edge. The announcement was made by Sam A. Davis, vice president and general manager of C. P. Hall Co. of Illinois, who said that the move was undertaken to help increase the war output of the Hall company's line of compounding materials, besides further improving the company's Midwest coverage and speed of distribution.

Sam A. Davis, J. A. Baty, C. P. Hall, and C. R. Hall

The site selected for the new facility contains 53,000 square feet of land, and the project is expected to be ready for operation in March. The local address is 5145 W. 67th St., Chicago, Ill. Some of the officials of the C. P. Hall Co. present during the first official inspection tour of the progress of construction of the new plant are shown in the accompanying illustration.

Headquarters for operation of the C. P. Hall Co. is at Akron, O., from which point the company serves the eastern field, with warehouses in both New York and Boston. C. P. Hall is president of the company; other officers are A. E. Warner, vice president, and L. G. Hummel, secretary-treasurer. Besides the Illinois company, the corporation also operates the C. P. Hall Co. of California, of which R. D. Abbott is vice president and general manager.

The appointment of J. T. Adair, as southern representative of the Chicago plant, with headquarters in Atlanta, Ga., was also announced.

Monsanto Chemical Co., St. Louis, Mo., has started full-scale production at the Duck River Plant, C.W.S., a new government-owned plant which Monsanto operates for Chemical Warfare Service at Monsanto, Tenn., to manufacture vital war chemicals. Costing more than $2,500,000, the new plant adjoins and utilizes byproducts of Monsanto's elemental phosphorus plant, said to be one of the largest works of its kind in the world. Between 100 and 150 persons are being employed in the new plant, with key personnel from the company's various phosphate division plants. A. T. Beauregard, plant manager of the elemental phosphorus works, is in general charge, and John C. Garrels, Jr., is superintendent. Monsanto at present operates five government-owned war plants in addition to 18 of its own located from coast to coast.

United Carbon Co., Inc., Charleston, W. Va., has reported that its Chicago office is now located at Suite 1620, 135 S. LaSalle St., Chicago 3, Ill. (Telephone, Central 1353-1354.) C. M. Baldwin is Chicago district manager.

Dow Chemical Co. plans construction of a refinery building at 20021 S. Vermont Ave., San Pedro, Calif., to cost $9,000.

Plastic & Rubber Products Co. is erecting an addition to its plant at 2100 Hyde Park Blvd., Los Angeles, Calif., to cost approximately $2,000.

OHIO

Thomas Reports to Stockholders

The Firestone Tire & Rubber Co., Akron, held its annual meeting on January 13 at which the following directors were reelected: John W. Thomas, Harvey S. Firestone, Jr., Lee R. Jackson, John J. Shea, James E. Trainer, Harvey H. Hollinger, Russell A. Firestone, Stacy G. Carkhuff, and Leonard K. and Raymond C. Firestone. Then at the directors' meeting all officers were reelected: chairman, Mr. Thomas; president, Mr. Firestone, Jr.; executive vice president, Mr. Jackson; vice president and treasurer, Mr. Shea; vice president in charge of production, Mr. Trainer; vice president in charge of sales, Harold D. Tompkins; secretary, Mr. Hollinger; comptroller, Claude A. Pauley; assistant treasurers, Russell Firestone and William D. Zahrt; counsel and assistant secretary, Joseph Thomas; assistant secretary, Henry S. Brainard; assistant comptrollers, Timothy F. Doyle and Laurence A. Frese. E. H. Schulenberg was elected assistant treasurer to succeed the late Ralph S. Leonard.

In his address to the stockholders Chairman Thomas told of the urgent need of greater military tire output and forecast greater use of electronic devices in rubber manufacturing processes. He stated that a promising future for electronics in the manufacture of tires also is indicated by experiments under way in the company's laboratories. Electronic vulcanizing of rubber already has been accomplished by Firestone research departments. Sponge rubber mattresses, moreover, have been cured experimentally with the rapidly oscillating currents produced by electronic devices in one-tenth the time required by conventional processes. The same method of heating has been used successfully with many other thick rubber products.

Mr. Thomas further reported that electronic controls are increasing the accuracy of many of the company's factory operations and have been found particularly useful in regulating the time and the temperature of the rubber-curing process. An electronic microscope to be installed in the new Firestone research laboratory, to be completed within the next few months, will magnify 20,000 times instead of the 4,000 times possible with other devices. Besides an electronic sewing machine that stitches with heat instead of thread is being used in the fabrication of products from Firestone plastic films and new fabrics.

In covering plant expansions necessitated by the need of increased output to meet war demands the Firestone executive revealed substantial increases in the company's textile producing facilities in Bennettsville, S. C., Fort Worth, Tex., Gastonia, N. C., New Bedford, Mass., and Woodstock, Ont., Canada, all of which are supplying constantly increasing quantities of nylon cord for large combat aircraft tires, as well as cotton and rayon cord for other tires. To provide more manufacturing space for the Pacific Coast division Firestone leased and equipped a plant at Ferndale, Wash.; while the Firestone Steel Products Co. expanded its plant facilities in Akron and Wyandotte, Mich., and leased and equipped a factory in Milwaukee, Wis. Production of pontoons was transferred from Akron to Winston-Salem, N. C. Then, too, considerable new equipment was installed in the Port Elizabeth and Bombay factories for the manufacture of airplane tires. These facilities enabled

the Allied Air Forces in the Middle East and the China-Burma-India theaters to obtain tires from nearby factories.

Mr. Thomas further declared that the capacity of the synthetic rubber plants which Firestone operates for the government in Akron, Lake Charles, La., and Port Neches, Tex., is well over 150,000 tons a year.

The War Department on February 16 announced authorization for construction of heavy-heavy truck rim facilities at the Firestone Truck Rim Project, Cambridge, O. The authorized expenditure totals $1,150,000. Work will be supervised by the Pittsburgh, Pa., District Office of the Corps of Engineers.

Russell A. Firestone has been elected a vice president and trustee of the National Victory Garden Institute. Mr. Firestone was a vice president of the organization in 1944, but this marks his first year as a trustee.

New Pharis Tire Plans

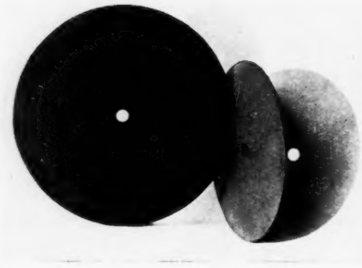
The Pharis Tire & Rubber Co. and The Park National Bank, both of Newark, on February 1 inaugurated an entirely new plan for handling tire certificates, said to be the first of its kind in the industry. Instead of Pharis jobbers sending their free tire ration certificates directly to the company, they now send them to the bank, which has opened a branch in the Pharis plant exclusively for the handling of these certificates. A certificate account is opened in the jobber's name to which is credited tire "ration currency" deposited with it and against which is charged all certificates withdrawn to cover tire shipments. The entire service is without charge to the jobber. The plan was conceived and put into operation by Hynes Pitner, Pharis vice president in charge of sales, with the cooperation of the bank's president, E. D. Reese.

Mr. Pitner also announced last month the opening of a Pharis office at 11 W. 42nd St., New York 4, N. Y., in charge of Bill Weiss.

Pharis has also announced plans for a production celebration program early in May, following the termination of a 120-day period of full production with no absenteeism, which was inaugurated January 1 and ends April 30. President Furber Marshall has stated that every employe whose job has any connection with tire building, and who works the entire 120-day period, will be a guest of the company at a "Production Banquet." At this banquet every worker who was present on every working day during the 120-day period will be presented with an official certificate of commendation from the War Department and a special award of merit from Pharis.

The Timken Roller Bearing Co., Canton 6, has appointed Everett C. Hite combustion and refractories engineer in its steel mill metallurgical department. Mr. Hite had been an assistant engineer in the department.

John J. Yezbak has been made manager of public relations as well as of Timken's news bureau. He has been head of the bureau since joining the company in June, 1943. The newly created public relations department was organized to coordinate all public relations activities of the Timken company.



Hycar Bonded Abrasive Wheels

Synthetic Rubber as Abrasive Wheel Bond

Hycar Chemical Co., Akron, O., recently released reports citing the use of a special-purpose butadiene synthetic rubber developed by Hycar which promotes the manufacture of fast-cutting, long-lasting abrasive wheels for the metal working trades. Results of tests conducted by the abrasive division of West Co., Inc., were reported to Hycar as follows:

"Manganese bronze castings were cut with a natural rubber-bonded wheel making 50 cuts for a total of 562½ square inches. A Hycar-bonded wheel on the same work made 99 cuts for a total of 1013¾ inches. . . Each wheel was 16 inches in diameter by ⅛-inch thick, operating at 16,000 surface feet per minute, 3,800 revolutions per minute spindle speed."

The same company's test on aluminum bronze castings were to take 10 cuts each with a natural rubber wheel and the special-purpose synthetic rubber wheel. The wheel bonded with Hycar cut 141 square inches, and the wear was 0.43-square inch per square inch of metal cut in comparison with the natural rubber-bonded wheel which cut 112 square inches and showed a wear of 0.627-square inch per square inch cut.

Bancroft-Hickey Mfg. Co. reported that Hycar is the "only possible substitute for natural rubber in bonding grinding wheels; it is compatible with resins; and it has good heat resistance."

Also lately described were Hycar rubber gaskets used to seal five-gallon army fuel containers—"blitz cans." By hand turning the can's closure a complete seal for any climate is obtained. Hycar's inertness to gasoline and oil circumvents swelling of the butadiene rubber gasket and permits easy loosening of the closure. The gaskets are also produced in larger sizes for sealing 55-gallon steel drums. A Hycar bushing and washer for a flexible tube spout used in emptying "blitz cans" have also been developed. The bushing is applied at the end of the spout, and by means of a cam in the tube the bushing is expanded into the opening to empty the can. The gasket acts as a seal back of the bushing.

Goodrich to Erect Laboratory

The B. F. Goodrich Co., Akron, will redeem on March 15 out of its sinking fund $810,000 of first mortgage bonds, 4¼% series due 1956. The principal amount for each of the 810 bonds plus a premium of 2% of this amount plus accrued interest to March 15, 1945, will be paid on March 15, 1945, at the principal office of Bankers Trust Co., 16 Wall St., New York 15, N. Y.

Goodrich will construct a new research laboratory in Brecksville, O., on a tract of land on the Cleveland-Akron highway, about 20 miles from the company's operations in Akron.

"The company's heavy responsibility in the war effort, bringing additional demands upon the research division, makes it advisable to establish this activity in a new location as present laboratory facilities are overtaxed. The decision to locate this important activity in Brecksville was made after thorough consideration of a number of other available sites," President John L. Collyer said.

Architects have completed principal plans and designs, and construction work will be started as soon as possible, according to H. E. Fritz, the Goodrich company research director.

Personnel Notes

Wm. E. Ireland has been named manager of passenger-car tire and tube sales in the tire replacement division. Since October, 1943, Mr. Ireland had been on loan from the company to the WPB as chief of its production division on tires and tubes; he will continue to serve WPB as a consultant. A graduate of Ohio Wesleyan University, Mr. Ireland joined Goodrich in 1934 with the Associated Tire Lines division, and held various posts until transferred to Washington in December, 1942, with the automotive, aviation and government sales division, where he remained until he took up his duties with WPB.

F. Elliott Wood, with Goodrich since 1919 in the industrial products division, New York district, was made manager of the company's international division in New York, N. Y.

D. L. Pellett has been named manager of the company's engineering design department. Mr. Pellett, who joined the company in 1936 after his graduation as an engineer from the University of Cincinnati, had been assistant manager of the department and succeeds the late W. K. Williams.

Two new districts, with headquarters in Indianapolis, Ind., and Birmingham, Ala., have been established by the Goodrich tire division, with C. W. Cordry, manager at Indianapolis and D. M. Tatem at Birmingham. The company now has 28 districts in its national sales organization for tires, tubes, batteries, and merchandise for auto and home. Mr. Cordry had been general supervisor in the Cincinnati district for 18 months, handling company operations in the Indianapolis area, following his transfer from the Kansas City district, where he joined the company in 1937. Mr. Tatem became district operating manager in Atlanta, Ga., in 1937, being transferred from a similar post in the Philadelphia district, which he had held six years. He was made store supervisor in 1940 and general supervisor in 1944.

To provide expanded training and recreation facilities for its employes, separate education and recreation departments have been established by Goodrich, according to Paul L. Dildine, manager of the factory standards division. Albert E. Peterson, formerly director of training for the Commonwealth Edison Co. Chicago, will direct the factory training activities; while Charles A. Mears will continue to direct recreation activities.

Stanley W. Caywood, general manager of the Goodrich international division, has been named co-chairman of the committee on light and heavy industry by the China-American Council of Commerce and Industry. Forty Chinese technical and trade authorities are now in the United States

conferring with American business leaders on postwar plans for reciprocal trade between the two nations.

John L. Collyer, Goodrich head, has been made a vice president of the National Association of Manufacturers and a member of its executive committee.

Goodyear Expanding Plants

Construction of a new $10,000,000 factory at Nashville, Tenn., by The Goodyear Tire & Rubber Co., Akron, for the manufacture of large military truck tires, was revealed last month. Goodyear will build and operate the plant as another of its series of manufacturing units engaged in the output of war materiel. The new factory, mostly one-story construction, will be 1,000 by 400 feet and will employ about 1,000 persons, who will be recruited from the surrounding area and trained by a nucleus group from the company's manufacturing organization. Plant design is practically completed, and construction will start without delay.

Additional construction of plant buildings to the Goodyear factories in Gadsden, Ala., also for making military tires, is planned. The Gadsden plant will have a new wing, corresponding to a recently completed tire production wing. The new wing, 560 by 250 feet, part of which includes a 150-foot mezzanine floor section, will add 300 persons to the Gadsden payroll. This new unit will add 800 tires and tubes to the daily output of the factory.

Expansion of the manufacturing and raw materials storage facilities at Goodyear's Topeka, Kan., plant are under way. The factory, begun in September 1944, will, when finished about April 1, manufacture large military tires. The original building, measuring 900 by 150 feet, has already had an addition of 100 by 900 feet. The increase in plant production capacity provides for an additional manufacturing area of 100 by 900 feet and includes a two-story building 100 by 350 feet for materials storage.

With the addition in plant area the total employment at the new factory when in full operation will be 850 persons.

Paul W. Litchfield, chairman of the board, last month announced the construction of a $1,500,000 chemical plant in Natrium, W. Va., which will manufacture vinyl chloride copolymers by a catalytic process. This new plant will have a capacity of three million pounds a year. It will produce also a considerable number of the other organic compounds which will be used in the copolymerization process. WPB permission was granted to build the plant because it will help relieve shortages of natural rubber products.

It has been established that the new plastics can be made into a large variety of forms, such as transparent films or thicker sheets, used to coat cloth or paper, and for the insulation of wire. They are expected to have a wide field of utility; one of the chief war uses is the packaging of materials and supplies for shipment to all war fronts. These plastics can also be used for packaging metallic objects, the manufacture of gun bags, as a fabric coating wherever a waterproof or abrasion resistant coating is required, for insulating electric wires, and even as a lightweight hose that will resist both oil and the deteriorating effects of the ultra-violet rays of the sun. These are only some of the many uses to which these plastics will be put, according to L. B. Sebrell, Goodyear's director of research.

An important fact is that one of these vinyl chloride copolymers can be vulcanized like rubber, and, as a result, a great many uses are seen for this particular copolymer as a substitute for rubber. In fact the Goodyear research laboratory has built a tire from this copolymer as a matter of research and experiment.

P. W. Westerman, Netherlands India Government, O. S. Franks, English Ministry of Supply, and P. W. Litchfield, L. B. Sebrell, and E. J. Thomas, of Goodyear, Watch Demonstration of Stretch-Wrapping Apples with Pliofilm

As the result of vastly increased industrial activity in North and South Carolina and Virginia, Goodyear has opened a new completely staffed and equipped district office at 209 E. Seventh St., Charlotte, N. C., for its mechanical goods division. This office is headed by R. G. Abbott, transferred from Richmond, Va. His staff includes G. T. Mahoney, transferred from Buffalo, and W. C. Killick, veteran Goodyear mechanical goods representative and an additional representative to cover the North Carolina territory. The Charlotte mechanical goods staff was selected for its especial abilities in servicing shipyards, industrial plants, paper mills, textile mills, coal properties, and other users of industrial rubber products in Virginia and in the Carolinas.

The Standard Equipment Co., Phoenix, Ariz., has been appointed the first distributer for Wingfoot Homes, Inc., pre-assembled house manufacturing subsidiary of the Goodyear company. Standard Equipment, affiliated with Dorris-Heyman Co., leading retail furniture outlet in Phoenix, will be distributer of Wingfoot Homes for the state of Arizona. Working under wartime housing regulations, production is now under way on an initial allocation of 100 Wingfoot Homes in the company's pilot plant at Litchfield Park, Ariz. These homes will be used to house workers from essential industries in the Phoenix area. Production of Wingfoot Homes is limited at present to that permitted under government war housing rules.

Goodyear's safety department recently announced that the company's plant at Norrkoping, Sweden, a winner of the 1944 interplant safety contest will receive the Slusser cup in recognition of its achievement. The factory had one lost-time accident during the year. Goodyear-Decatur, Ala., a textile mill, was runner-up, finishing the year with six accidents. Goodyear-Akron plants are divided into 17 operations which, with the smaller domestic and foreign factories, make a total of 45 units competing in the annual campaign to reduce accidents. Aircraft Plant D was the only Akron unit to finish among the first ten.

Surrounded by Nazi-held territory since the beginning of the war, production at the Swedish plant has been necessarily curtailed, but it still manages to turn out a considerable production for the strictly Swedish market. John J. Hoesly is superintendent of the plant, having gone there from Akron as development manager when the factory started in 1938. He became superintendent in May, 1942, when V. L. Follo, superintendent of Goodyear Aircraft Plant D, returned to Akron.

In just slightly more than a year of operation the Houston plant of The Goodyear Synthetic Rubber Corp., one of the first "standard" synthetic rubber plants in the war program, has turned out its 100,000,000th pound of synthetic rubber, and practically all of the rubber produced is being converted into tires and other military products.

Built and operated for Rubber Reserve Co. by The Goodyear Tire & Rubber Co., of which Goodyear Synthetic Rubber Corp., is a subsidiary, the Houston plant was placed in operation in October, 1943, with an annual rated capacity of 60,000 long tons. It consists of 27 buildings on more than 52 acres. Claude W. Smith, plant superintendent, stated that the plant's annual capacity is equal to the output of a 340,000-acre rubber plantation with about 33,600,000 trees, based on a rubber tree's normal yield of four pounds annually.

International Rubber Group at Goodyear

In touring Goodyear Aircraft and the Goodyear research laboratory, members of the International Rubber Study Group were informed by L. B. Sebrell, the laboratory head, that for several years after the war, there would be markets for all (postwar) rubber production, both synthetic and natural. Dr. Sebrell also told the group of several advances in synthetic rubber, including special types: one with low water absorption and the other having high resistance to heat—and a synthetic rubber latex having a 50% rubber concentration instead of the usual 30%. Dr. Sebrell discussed other developments with regard to postwar applications and among those men-

tioned were: natural and synthetic rubber Airfoam; laminated Pliofilm for packaging; Pliolite and chlorinated rubber for ship bottom paints and similar uses; Neolite for shoe soles; Pliobond for metal joinings; and silicon rubber, which is excellent for insulation.

After leaving Akron, the international group returned to New York for further discussions.

R. G. Pauley has been appointed district manager in Pittsburgh of the mechanical goods division. He was transferred from the Cleveland office to replace C. A. Mathias, transferred to Buffalo.

Earl W. Glen, one of Goodyear's most rounded experts on production of tires and other rubber products, recently reported to the U. S. Army Ordnance Department and is now on an assignment with military forces abroad as a consultant and expert on matters pertaining to rubber. In 16 years with the development department of Goodyear, Mr. Glen was associated intimately with practically every phase of tire production, including design of passenger and truck tires, development of fabrics and tire cord, and in field operations, including surveys on products performance.

Goodyear last month elected two new directors: L. B. Williams, of Cleveland, and A. G. Partridge, president of Goodyear Tire & Rubber Co. of Canada, Ltd., Toronto, Ont. They fill vacancies created by the recent deaths of George Martin and Francis Seiberling.

"Vitafilm," a New Synthetic

A derivative of polyvinyl chloride, called "Vitafilm," has been announced by A. F. Landefeld, manager of Goodyear's Pliofilm department. Made in six gages of sheet form, it is adapted for food bags, bowl covers, and garment bags; the heat sealed or stitched "Vitafilm" is suitable for umbrellas, raincoats, and similar products.

"Vitafilm" in thin strips can be stretched and twisted into thread for looms; then it is woven much like cotton or rayon for fabrics. These "Vitafilm" fabrics, utilizing the same type of pattern and color design as other fabrics, are particularly suited for shower curtains, ladies' hand bags, shoe uppers, and other articles where lightness and resistance to water are a primary consideration; they can be cleaned by wiping with a damp cloth.

This product, developed in the new Goodyear research laboratory, is being produced on a limited scale in a Goodyear pilot plant and is now finding its principal use in the war effort.

CANADA

Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., recently announced a number of new appointments, including that of W. H. Bartlett as assistant works manager from the post of production superintendent. In addition Reg. Hughes moves from head of the process control and product design, mechanical goods, into the position vacated by Mr. Bartlett. Norman S. Grace, head of the laboratory, becomes technical superintendent; Sid Parkes succeeds Mr. Hughes; Evan Young is now superintendent of materials supply and production clerical; while William Morrison becomes superintendent of the tire and tube division.

Dunlop Tire is revealed to have aided in the development of an anti-blackout flying suit adopted by the American, British, and Canadian air forces. The suit, tightly fitting and with water-filled pouches which exert pressure at certain strategic points where the blood vessels would otherwise distend, was perfected by Wing Commander W. R. Franks, of the Royal Canadian Air Force, a Toronto medical scientist. Dr. Franks, aided by specially assigned Dunlop workers conducted his early experiments in the Dunlop laboratory. Many service tests also were made in England in cooperation with Dunlop-England where the design was eventually finalized.

Polymer Corp., Sarnia, Ont., has placed orders for fly ash precipitation equipment to cost more than $250,000 and expected to be in full operation by late spring or early summer. In making the disclosure the company stated it had always recognized that fly ash emanating from various stacks on the property had been a source of annoyance to householders in Sarnia and nearby Port Huron, Mich. However the condition could not be corrected earlier because of steel shortages. Allowance was made by design engineers when the plant was constructed for the future installation of precipitation equipment.

Kenneth Fellows, resident engineer in charge of construction of Polymer Corp. for the past two years, has been appointed executive secretary and engineer of the Greater Niagara Postwar Planning Committee.

OBITUARY

John Hall

WORD has been received from abroad of the recent death in Birmingham, England, at the age of 75 of John Hall, who had been associated with the Dunlop Rubber Co., Ltd., Fort Dunlop, Birmingham, for more than 50 years. When he was 21, Mr. Hall entered the world's first pneumatic tire workshop, the Dunlop factory in Coventry, as an operative. He advanced to the position of works manager and contributed to the development of the pneumatic tire by working with company chemists on the compounding of rubber for these tires. After retiring the summer before the war, when he was presented with a silver casket from his colleagues and other Dunlop workers, Mr. Hall returned to Fort Dunlop in June, 1941, to help in the national emergency.

Surviving him are the widow, a son, and a daughter.

William H. Waldron

WILLIAM HUBELI WALDRON, vice president and director of the John Waldron Corp., New Brunswick, N. J., died at his home there on February 1. The deceased was the grandson of William Waldron, who founded the business in 1827, and the son of John Waldron for whom the present corporation was named. William H. Waldron became associated with the John Waldron Co., 1885 and was active in its management until 1924, when the present John Waldron Corp. was formed.

Mr. Waldron was born in New Brunswick June 22, 1865, and entered upon his career as a machinery builder after his graduation from Rutgers University, of which he became a life trustee and later a vice president. He was also a director of the National Bank of New Jersey and of the Interwoven Stocking Co. and numerous other corporations as well as manager of the New Brunswick Savings Institution and a member of the American Society of Mechanical Engineers, Franklin Institute, University Outing Club, Union Club of New Brunswick, and the Holland Society.

He is survived by his wife and a sister.

FINANCIAL

Goodyear Tire & Rubber Co., Akron, O. For 1944: consolidated sales, $786,722,287 (a new high), against $726,569,275 in 1943; net profit, $15,204,270, equal to $5.90 a share, compared with $14,799,048, or $5.68 a share.

Goodyear Tire & Rubber Co. of Canada, Ltd., Toronto, Ont. For 1944: net profit, $1,187,699, compared to $1,448,537 for 1943; net earnings equivalent to $4.14 a common share, against $4.51; dividends paid, $287,368 on 5% preferred stock and $1.3 millions on common, against $1.2 millions on common in 1943; working capital, $9,459,106, against $10,412,214.

The Mohawk Rubber Co., Akron, O. For 1944: net income, $361,119, equal to $2.55 a common share, compared with $354,434, or $2.50 a share, in 1943; taxes, $1,038,150, against $1,289,820; net sales, $6,715,016 (a record figure), against $5,290,996; current assets, $1,674,465.44; current liabilities, $363,593.46.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
E. I. du Pont de Nemours & Co., Inc.	Com.	$1.25 interim	Mar. 14	Feb. 26
E. I. du Pont de Nemours & Co., Inc.	Pfd.	1.12½ q.	Apr. 25	Apr. 10
Flintkote Co.	Com.	0.15	Mar. 10	Feb. 24
Flintkote Co.	Pfd.	1.12½ q.	Mar. 10	Feb. 24
Hewitt Rubber Corp.	Com.	0.25 q.	Mar. 15	Mar. 1
Thermoid Co.	Com.	0.10 q.	Mar. 15	Mar. 5
Thermoid Co.	$3 Conv. Pfd.	0.75 q.	Mar. 15	Mar. 5
United Elastic Co.	Com.	0.40 inc.	Mar. 10	Feb. 20
United States Rubber Co.	Com.	0.50	Mar. 12	Feb. 19
United States Rubber Co.	Pfd.	2.00	June 11	May 21
United States Rubber Co.	Pfd.	2.00	Mar. 12	Feb. 19

Patents and Trade Marks

APPLICATION

United States

2,366,161. **For Sealing a Circular Crack between Two Members Containing a Fluid under Pressure, a Sealing Ring of Flexible Material Having the Resilient Characteristics of Rubber.** R. L. Tweedale, assignor to Vickers, Inc., both of Detroit, Mich.

2,366,183. **To Prevent Raveling in a Simulated Lace Product, the Use of a Synthetic-Resin-Like Composition.** N. E. Dahlman, New York, N. Y.

2,366,214. **Nipple for a Nursing Bottle.** R. E. Ramaker, Seattle, Wash.

2,366,274. **Thermoplastic Fastening Means for Securing together Two Parts of Thermosetting Material.** H. J. Luth, Muskegon Heights, and H. B. Scheidemantel, Muskegon, both in Mich., assignors to Brunswick-Balke-Collender Co., Chicago, Ill.

2,366,291. **Heat Insulating Tape.** O. J. Rudolph, assignor to Union Asbestos & Rubber Co., both of Chicago, Ill.

2,366,323. **Arch Support Having a Body Made from a Single Piece of Resinous Material.** Z. Fried, New York, N. Y.

2,366,377. **Plant-Stem Holder Made of Sponge Rubber Reenforced by a Sheet of Vulcanized Rubber.** G. B. Zois, Bronx, N. Y.

2,366,393. **For an Apron Having a Body Part and a Guideway, a Tape Including an Elastic Section and a Non-Elastic Section.** A. S. Geisinger, New York, N. Y.

2,366,427. **Resilient Gasket in a Portable, Sanitary Drinking Fountain.** A. A. Scheid, Rochelle Park, N. J.

2,366,442. **Tank Fitting Including an Annular Body of Flexible Material, a Pair of Radially Extending Flanges for Attachment to Tank Wall, and a Fabric Reenforcing Strip Disposed Intermediate to the Flanges.** M. M. Cunningham, South Bend, Ind., assignor to United States Rubber Co., New York, N. Y.

2,366,450. **Block for an Articulated Block Track Including a Hollow Frame Structure through Which Extend Connector Members Enclosed at the Ends in Elements of Resilient Material, and Substantially Solid Block of Non-Metallic Material.** A. S. Krotz, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,366,514. **Composition Consisting of a Relatively Thick Cross-Section of Solid Organic Plastic and a Relatively Thin Flexible Film of Glass Cemented on at Least a Portion of the Exposed Plastic, thereby Protecting the Exposed Surface of the Plastic.** P. J. Gaylor, Union, N. J., assignor to Standard Oil Development Co., a corporation of Del.

2,366,638. **Resilient Tire.** J. C. Miller, Russell, Minn.

2,366,672. **As Base for Chewing Gum, a Polyvinyl Alkyl Ether.** G. B. Mustin, Landsdowne, assignor to F. H. Fleer Corp., Philadelphia, both in Pa.

2,366,764. **For Retaining Shroud Lines of a Parachute Pack, Strips of Elastic Material Secured at Their Ends to a Member of the Pack.** H. Wilson, Dayton, O.

2,366,778. **In an Arbor Chuck for Gripping a Tubular Member of Ceramic Material during Polishing Operations without Slipping or Crushing, a Clamping Sleeve within Which Is a Resilient, Annular Member.** H. R. Feichter, assignor to United States Quarry Tile Co., both of Canton, O.

2,366,860. **In a Pivotal Connection between Members Adapted to Have Relative Torsional Movement, a Bushing of Soft, Resilient Rubber-Like Material.** H. T. Kraft, assignor to General Tire & Rubber Co., both of Akron, O.

2,366,904. **In an Oxygen Tent Having a Face Piece of Rigid, Transparent Material, a Band of Soft Sponge Rubber-Like Material Bordering the Face Piece.** G. A. Haugh, assignor to Haugh's Products Ltd., both of Toronto, Ont., Canada.

2,366,989. **Bag of Thin Flexible Rubber to Cool a Portion of a Patient's Body.** B. R. Robertson, San Diego, assignor to Freez-A-Bag, Inc., Los Angeles, both in Calif.

2,367,006. **Elastic Bands in the Top and Bottom Hems of a Head Protector of Tubular Net.** D. Cope, Philadelphia, Pa.

2,367,188. **Hose Coupling for Vacuum Cleaners, Having a Resilient Clamping Ring of Elastic Material.** O. M. Anderson, assignor to Landers, Frary & Clark, both of New Britain, Conn.

2,367,249. **Thrower for Grenades, Etc., Consisting of Two Elastic Stretchable Bands.** B. Walker, Piedmont, Calif.

2,367,250. **In a Method of Center Spotting Cushion Disks in Caps, the Use of Material Coated with a Thermoplastic and Pressure Sensitive Adhesive Made of Resin, Wax, and Rubber.** A. H. Warth and E. Lidard, assigrors to Crown Cork & Seal Co., Inc., all of Baltimore, Md.

2,367,307. **Windshield Wiper.** C. L. Osborn, Cheyenne, Wyo.

2,367,409. **In an Interlock, a Resiliently Depressible Gasket.** O. A. Kuhler, Blauvelt, N. Y.

2,367,411. **In an Oil Seal Assembly, a Channel-Shaped Retaining Shell Composed of a Pair of L-Shaped Telescoping Sections, One of Which Is Formed of Laminations of Resin-Impregnated Fiber Board.** S. M. Lillis, assignor to Victor Mfg. & Gasket Co., both of Chicago, Ill.

2,367,481. **Plastic Soles.** J. Burger, Yonkers, N. Y.

2,367,628. **In a Resilient Seat Construction, an Inflatable, Pneumatic Cushion.** M. C. Teague, Ridgewood, N. J., assignor to United States Rubber Co., New York, N. Y.

2,367,657. **In an Attaching Device Including a Plate and Stud with Enlarged Head, a Socket of Elastic, Plastic Material Having an Opening through Which the Stud Extends.** R. A. Boersma, assignor to Duffy Mfg. Co., both of Holland, Mich.

2,367,683. **Cap with Eraser for a Mechanical Pencil.** S. G. Lopez, New York, N. Y.

2,367,697. **In Combination with a Fixed Mounting Frame of a Vehicle, and a Fixed Mounting Lug of an Engine Housing, a Resilient Shock and Vibration Coupling Connecting Frame and Lug.** W. E. Stitz, and D. C. Kennard, both of Dayton, O.

2,367,779. **In Apparatus to Form Material Involving the Application of Pressure and Heat Exchange, the Use of a Rubber Conforming Sheet.** C. J. Hull, Kenmore, N. Y., assignor to the Rudolph Wurlitzer Co., Chicago, Ill.

2,367,786. **Article with High Impact Resistance and Formed Entirely of Hard Rubber of Different Degrees of Hardness.** E. R. Laning, Philadelphia, Pa., assignor to Joseph Stokes Rubber Co., Inc., a corporation of N. J.

2,367,796. **Rubber-Covered Press Roll for Paper-Making Machines.** E. Peterson, Cuyahoga Falls, and A. B. Merrill, Akron, both in O., assignors to B. F. Goodrich Co., New York, N. Y.

2,367,806. **Parenteral Administration Set Including Cellulose Tubing with an Adapter Extending into One End, a Rubber Member Attached to the Adapter, Rubber Tube Connection, and Rubber Sleeve Slidable on the Tubing.** J. E. B. Shaw, Chicago, Ill.

2,367,817. **In a Suspension for Motor Vehicles, Rubber-Lined Connections between a Hotchkiss-Type Rear Axle and a Radius Rod Controlling the Position of the Axle.** R. W. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,367,818. **Seadrome Contact Light Buoy.** J. A. Diehl, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,367,820. **Pneumatic Tire, Bead Lock, and Rim Assembly.** W. S. Brink, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,367,824. **Molded Fender Guard Having a Hard Rubber Base Layer and Vulcanized thereto a Facing Layer of Soft Rubber.** F. S. King, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,367,826 and 2,367,830. **Resilient Mounting.** L. M. Kubaugh, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,367,832. **Bushing Assembly Including a Rubber Bushing Vulcanized to a Metal Sleeve.** E. F. Riesing, Pontiac, Mich., assignor to Firestone Tire & Rubber Co., Akron, O.

2,367,833. **Rubber Elements in a Motor Mounting.** E. F. Riesing, Pontiac, Mich., assignor to Firestone Tire & Rubber Co., Akron, O.

2,367,834. **Rolling Ring for Barrels Including a Split Metal Ring and Over It and Mechanically United with It, a Split Ring of Rubber or Rubber-Like Material.** M. O. Kuhn, Cuyahoga Falls, assignor to Firestone Tire & Rubber Co., Akron, both in O.

2,367,835. **Inflatable Boat Floor.** J. G. Kreyer, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,367,836. **Cable Guide Bushing with an Annular Body of Elastic Material.** R. W. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,367,882. **Interlocking Sealing Device.** W. M. McKnight, Butler, Pa.

2,367,891. **Adjustable Dress Form with an Outer Network of Flexible, Relatively Soft, and Deformable Plastic Rods.** F. S. Sander, assignor by direct and mesne assignments to Frank and J. Sander and I. and I. Waldes, doing business under the name of My Double Co., all in New York, N. Y.

2,367,953. **Fuel Tank or Container Having Top, Bottom, and Enclosing Wall Parts of Multi-Ply Impervious Fabric.** J. Lloyd, Salford, assignor to J. Mandleberg & Co., Ltd., Pendleton, both in England.

2,367,996. **Cord Assembly for an Iron.** E. K. Clark and J. R. Heilman, both of Mansfield, O., assignors to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

2,368,181. **In a Force Transmitting Means, a Bodily Slidable Sealing Plug of Elastic, Vulcanized Material.** S. Vernet, assignor to Vernay Patents Co., both of Yellow Springs, O.

2,368,200. **Rubber Pad for Automobile Fenders.** G. F. Cavanaugh, Euclid, O.

2,368,220. **Sleeping Bag with Waterproof Covering.** S. R. Hinds, United States Army.

2,368,272. **Individual Protective Cover for Emergency Use in a Gas Attack.** H. G. Sydenham and H. W. Clowe, both of United States Army, and A. E. Du Bois, Washington, D. C.

2,368,397. **In an Abrasive Tube Drill, an Elongated Thin - Walled Body Consisting of Abrasive Particles and Metal Wool Fibers Bonded with Rubber.** H. V. Allison, Fairfield, assignor to Allison Co., Bridgeport, both in Conn.

2,368,398. **Tubular Casing of Rubber Hydrochloride for Packing Meat.** J. A. Baker, Shorewood, assignor to Milprint, Inc., Milwaukee, both in Wis.

2,368,431. **Ampoule with Stopper of Resilient Material.** A. E. Smith, Los Angeles, Calif.

2,368,433. **Knee Pad Consisting of a Rigid Shoe Containing a Fabric Cover, within Which Is a Hollow Inflatable Bladder.** R. A. Terry, Lodi, Calif.

2,368,533. **Split Rubber Bushings in a Radial Aircraft Engine Mounting.** W. S. Fletcher, South Pasadena, assignor to Fletcher Aviation Corp., Pasadena, both in Calif.

2,368,548. **Terminal Stud for Electrical Equipment Including a Shank, Having a Unitary Median Circular Flange, and on the Face of the Flange a Flat Molded Soft Rubber Disk.** A. G. Kalstein, assignor to Aerovox Corp., both of New Bedford, Mass.

2,368,561. **Containers of Thermoplastic Rubber Hydrochloride for Packing Coffee.** G. A. Moore, New York, N. Y., assignor to Shellmar Products Co., Mount Vernon, O.

2,368,609. **An Electro-Mechanical Conversion Device Including Pairs of Piezo Electric Crystals Having an Elastic Layer between Each Pair.** E. Burkhardt, Berlin, Germany, assignor to General Electric Co., a corporation of N. Y.

Dominion of Canada

424,597. **Brassiere with Sections of Elastic Fabric.** G. St. Louis-Deslongchamps, Montreal, P. Q.

424,612. **Elastic Bonding Fluid for Making Composite, Unwoven Fabric.** F. W. Manning, Palo Alto, Calif., U. S. A.

424,643. **In a Process for Perforating Plaster Board, the Use of a Bilaterally Convex Rubber Pad against a Plaster Board Web.** Canadian Gypsum Co., Ltd., Windsor, N. S., assignee of United States Gypsum Co., Chicago, Ill., assignee of O. P. Haegele, Columbus, O., both in the U. S. A.

424,764. **In an Apparatus for Coating a Strand, a Die of Resilient, Compressible Material.** Western Electric Co., Inc., New York, N. Y., assignee of P. J. Knaus, Kinsdale, Ill., both in the U. S. A.

424,768. **For Packing Foodstuffs, a Laminated Sheet of Rubber Hydrochloride Film and Regenerated Cellulose Sheet United by an Adhesive.** Wingfoot Corp., Akron, assignee of L. B. Sebrell, Silver Lake, both in O., U. S. A.

424,869. **Fibrous Product Made from Non-Adhesive, Organic Fibers Combined with Fibers Formed from a Potentially Adhesive, Fiber-Forming Organic Plastic Material.** Sylvania Products Corp., Fredericksburg, Va., assignee of C. S. Francis, Jr., Chestnut Hill, Pa., in U. S. A.

424,889. **Multiple-Compartment Inner Tube for Pneumatic Tires.** C. H. Castagne, Hull, P. Q.

424,890. **V-Belt and Fastener.** V. R. Clark, Chicago, Ill., U. S. A.

424,907. **In Forming a Structure of Ordinary Hydraulic Cement Concrete Having a Glossy or Glazed Face, the Use of a Covering of Rubber Hydrochloride.** F. A. Williams, Toronto, Ont.

424,931. **Lug Strap with a Cushioning Layer of Laminated Rubberized Fabric.** Dayton Rubber Mfg. Co., assignee of H. M. Bacon, both of Dayton, O., U. S. A.

424,984. **Windshield Wiper.** Trico Products Corp., assignee of R. D. Curtis, both of Buffalo, N. Y., U. S. A.

424,994 **Gas-Mask Face Piece.** H. A. Husted, St. Clair, Mich., U. S. A.

425,013. **One-Piece Resilient Masking Device for Covering the Interior and End Portions of a Tubular Sleeve-Type Bearing.** J. E. Duggan, Birmingham, Mich., U. S. A.

425,017. **Expansion Joint Including a Pair of Panels of the Same Size, Held together by Elastic, Adhesive, Water-Resisting Gasket Material.** W. Grund, Detroit, Mich., U. S. A.

425,036. **Annular Packing Device Including in Combination with a Backing Ring of Soft Rubber, a Facing Element Separate from the Backing Ring; the Facing Element Is Composed of**

Wound Strips of Fabric Impregnated with Rubber or the Like. P. W. Thornhill, Leamington Spa, Warwick, England.

425,079. Resilient Shaft Coupling Including a First Coupling Plate, a Second Coupling Plate, an Annular Ring, and a Mass of Resilient Material Bonded to the Ring and to the Second Coupling Plate. Canadian Westinghouse Co., Ltd., Hamilton, Ont., assignee of J. D. Miner, Jr., and J. E. Mulheim, both of Lima, O., U. S. A.

425,123. Stopperless Water Bag. Seamless Rubber Co., New Haven, assignee of P. S. Madsen, Bethany, both in Conn., U. S. A.

425,133. Windshield Wiper. Trico Products Corp., Buffalo, assignee of C. Horton, Hamburg, both in N. Y., U. S. A.

425,138. Railway Truck Bolster Having a Recess for Receiving the Upper End of a Bolster Supporting Spring, and in the Bottom of the Recess a Flat Pad of Rubber-Like Material, and on the Side of the Recess below the Pad a Ring of Rubber-Like Material. K. F. Nystrom and V. L. Green, both of Milwaukee, Wis., and General Steel Castings Corp., assignee of E. S. Beckette, both of Granite City, Ill., both in the U. S. A.

United Kingdom

565,506. Mouthpieces for Breathing Apparatus. A. H. Stevens (F. G. Manson).

565,519. Shock Absorbing Mountings for Electrical Apparatus. Western Electric Co., Inc.

565,613. Collapsible Boats. W. Kidde Co., Ltd., and G. Lambert.

565,619. Insulated Electric Conductors. W. T. Henley's Telegraph Works Co., Ltd., H. A. Macdonald, and P. R. Stevens.

565,720. Shock Absorbers. Tyre Products, Ltd., and G. N. Highfield.

565,744. Insulated Electric Conductor. General Cable Corp.

565,763. Cushioning Devices for Stamping Presses. Worson Co., Ltd., and W. H. Eveson.

565,984. Laminated Electrical Insulating Material. British Industrial Plastics, Ltd., Micanite & Insulators Co., Ltd., A. Brookes, and G. E. Haefely.

566,009. Anaesthetic Apparatus. H. A. E. Talley.

566,074. Life-Saving Suits. R. H. Davis.

566,097. Buoyant Suits for Life-Saving Purposes. Z. Siedlecki and Siebe, Gorman & Co., Ltd.

566,137. Stiffeners for Shoes. British United Shoe Machinery Co., Ltd. (United Shoe Machinery Corp.).

566,166. Hinge Joints in Which Rubber Bushes Are Embodied. Metalastik, Ltd., M. Goldschmidt, and J. E. Moyal.

566,187. Vehicle Tires. N. Straussler.

PROCESS

United States

2,366,359. Applying Insulating Tubing on Wire Cables. M. O. Searle, Beverly Hills, Calif.

2,366,944. Continuous Process for Coating Wire with Colored Ribbons of Thermoplastic Material. J. Veit, Hounslow West, England.

2,366,173. Extruding Normally Solid Ethylene Polymers. E. L. Martin, Wilmington, Del.

2,367,642. Preparing Symmetrical Thermoplastic Domes. E. L. Helwig, Bristol, assignor to Rohm & Haas Co., Philadelphia, both in Pa.

2,367,725. Joining Thermoplastic Materials. G. Lindh and W. M. Phillips, Jr., assignors to Udylite Corp., all of Detroit, Mich.

2,367,819. Forming Rubber Articles from Aqueous Rubber Dispersions. M. Carter, Trenton, N. J., assignor to Firestone Tire & Rubber Co., Akron, O.

2,367,867. Golf Balls. H. N. Huse, Lansdale, Pa.

2,368,325. Pneumatic Tire. H. M. Renner, Fort Benning, Ga.

Dominion of Canada

424,863. Perforated Bags. Seiberling Latex Products Co., Barberton, assignee of A. E. Sidnell, Akron, both in O., U. S. A.

424,964. Tire Bead Reenforcement. National Standard Co., Niles, Mich., assignee of F. J. Shook, Akron, O., both in the U. S. A.

425,000. Laminated Product Having Elastic Characteristics. C. Dreyfus, assignee of L. Glass, both of New York, N. Y., U. S. A.

United Kingdom

565,496. Belting. Dunlop Rubber Co., Ltd., W. Lord, and H. Riding.

565,698. Laminating Rubber Hydrochloride Films. Wingfoot Corp.

565,924. Bonding Rubber to Metal. Rubber Bonders, Ltd., and H. E. Zentler-Gordon.

CHEMICAL

United States

2,366,209. Vulcanizing a Composite Tread of Polymerized Chloroprene Rubber to a Metal Deck Surface. R. E. Morris, Vallejo, Calif.

2,366,219. Adhesive Composition Consisting of a Mixture of Isoprene Resin and Rubber. F. J. Soday, Swarthmore, Pa., assignor to United Gas Improvement Co., a corporation of Pa.

2,366,306. Polymerizing a Vinyl Halide in the Presence of a Diacyl Peroxide Derived from a Fatty Acid Containing between 4 and 10 Carbon Atoms, Inclusive. C. H. Alexander and H. Tucker, both of Cuyahoga Falls, O., assignors to B. F. Goodrich Co., New York, N. Y.

2,366,313. Polymerizing an Aqueous Emulsion of a Butadiene-1,3 in the Presence of a Dialkyl Polysulphide in Which Each Alkyl Group Is Unsymmetrical. G. L. Browning, Jr., Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,366,315. Recovering Butadiene from a Mixture of Butadiene and C_4-Monoolefins. D. Craig, Silver Lake, assignor by mesne assignments, to B. F. Goodrich Co., Akron, O.

2,366,316. Increasing the Plasticity of Rubber by Milling Unvulcanized Rubber in the Presence of a Small Amount of a Salt of a Substituted Isothiourea. A. R. Davis, Old Greenwich, Conn., assignor to American Cyanamid Co., New York, N. Y.

2,355,317. In Vulcanizing Rubber, Controlling the Activity of the Accelerator by Incorporating a Small Amount of a Resinous Material from the Group of Monoterpenemaleic Anhydride Addition Product, Anhydrides thereof, and the Acids Obtained by Hydrolysis of the Anhydrides. A. R. Davis, Riverside, Conn., assignor to American Cyanamid Co., New York, N. Y.

2,366,325. Polymerizing a Butadiene-1,3 Hydrocarbon in an Aqueous Emulsion Containing a Free Higher Fatty Acid in a Concentration in Excess of That Which Is Equivalent to the Concentration of Hydroxyl Ions Present. C. F. Fryling, Silver Lake, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,366,326. Polymerizing an Aqueous Emulsion of a Polymerizable Butadiene-1,3 in the Presence of a Nitrodiaryl Polysulphide. C. F. Fryling, Silver Lake, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,366,327. Polymerizing in Aqueous Emulsion a Butadiene-1,3 Hydrocarbon in the Presence of a Dialkyl Dixanthogen and a Small Amount of a Conjugated Enine. C. F. Fryling, assignor to The B. F. Goodrich Co., New York, N. Y.

2,366,328. Copolymerizing a Butadiene-1,3 Hydrocarbon and an Aryl Olefin in the Form of an Aqueous Emulsion in the Presence of a Dixanthogen and a Diazoamino Aryl Compound. C. F. Fryling, assignor by mesne assignments to B. F. Goodrich Co., both of Akron, O.

2,366,360. Separating Butadiene from a Mixture of Four-Carbon Hydrocarbons Having a Substantially Constant Boiling Point. W. L. Semon, Silver Lake, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,366,361. Batch Method of Purifying Butadiene Mixed with Other Hydrocarbons of Similar Boiling Point. W. L. Semon, Silver Lake, and D. Craig, Cuyahoga Falls, both in O., assignors to B. F. Goodrich Co., New York, N. Y.

2,366,362. Separating Butadiene from a Mixture of 4-Carbon Hydrocarbons Having a Substantially Constant Boiling Point. W. L. Semon, Silver Lake, and D. Craig, Cuyahoga Falls, both in O., assignors to B. F. Goodrich Co., New York, N. Y.

2,366,396. Preparing a Rubber Substitute from Johnson Grass and Linseed Oil, Which Have First Been Heated Separately, Then Boiled together with Glue, Sulphur, Lamp Black, and Artimony Black for about 1¼ Hours. E. D. Hallett, Phoenix, Ariz.

2,366,409. Conversion of 8-Hydroxymenthenes to Products of Decreased Apparent Unsaturation, But of Similar Hydroxyl Content. A. C. Johnston, Washington, D. C., assignor to Hercules Powder Co., Wilmington, Del.

2,366,414. For Chemical Apparatus, a Protective Coating Made from a Mixture of Methacrylic Acid Ester and a Copolymer of Vinylidene Chloride and Vinyl Chloride. G. Lindh, assignor to Udylite Corp., both of Detroit, Mich.

2,366,425. Moldable Material from a Raw Material Consisting of a Pentosan Containing Farm Product. F. Riner, New York, N. Y.

2,366,452. Condensing Carboxylic Acid Amides Having at Least 6 Carbon Atoms, with a Formaldehyde Bisulphite Compound, in the Presence of a Small Quantity of Piperidine. L. Mack, Frankfurt a.M.-Unterliderbach, Germany, assignor to General Aniline & Film Corp., New York, N. Y.

2,366,460. Method of Coagulation to Produce Small Discrete Crumbs of Butadiene Polymer from an Aqueous Dispersion of the Polymer. W. L. Semon, Silver Lake, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,366,492. Composition of a Polyvinyl Acetal Formed from Polyvinyl Alcohol and an Aliphatic Aldehyde Containing a Stabilizer from the Group of Cyanamid and Dicyanamid. F. W. Cox, Cuyahoga Falls, assignor to Wingfoot Corp., Akron, both in O.

2,366,494. Composition Consisting of the Product of Reaction of (1) a Partial Condensation Product of Ingredients including Urea, Formaldehyde and Benzyl Sulphonamide with (2) a Curing Reactant Including a Chlorinated Acetamide. G. F. D'Alelio, Pittsfield, Mass. assignor to General Electric Co., a corporation of New York.

2,366,495. Molecularly Oriented Copolymer Including the Cold Drawn Product of Polymerization of a Mass Containing from 40 to 80% Acrylonitrile and at Least One Itaconic Ester. G. F. D'Alelio, Pittsfield, Mass., assignor to General Electric Co., a corporation of N. Y.

2,366,498. Subresinous Acidylation Derivative of a Reactive Hydrogen-Atom-Containing Acylated Compound. M. De Groote, University City, and B. Keiser, Webster Groves, both in Mo., assignors to Petrolite Corp., Ltd., Wilmington, Del.

2,366,589. Preparing a Polyhydric Alcohol Ester of Hydrogenated Resin of Reduced Stickiness, Improved Taste, and Increased Melting Point. J. N. Borglin, assignor to Hercules Powder Co., both of Wilmington, Del.

2,366,620. Producing Isoprene from a 3,3-Dimethyl Allyl Halide. G. W. Hearne and G. A. Stenmark, both of Berkeley, assignors to Shell Development Co., San Francisco, both in Calif.

2,366,781. Preparing Cellulosic Plastics from a Dispersion of Ligno-Cellulosic Material to Which Is Added Urea, a Mixture of Acetic and Sulphuric Acids and Lignin Resin. B. Geller, Fremont, O.

2,366,813. Composition Prepared by Chlorinating in the Presence of Metallic Magnesium, a Vapor-Phase Cracked Petroleum Product, and Then Polymerizing the Chlorinated Material. T. Smedslund, Helsingfors, Finland, assignor to J. Bjorksten, Chicago, Ill.

2,366,895 and 2,366,896. Composite Articles of Rubber Bonded to Metal. T. R. Griffitch, assignor to Honorary Advisory Council for Scientific and Industrial Research, both of Ottawa, Ont., Canada.

2,367,000. Hydroxylated Dehydroabietic Acid Compound Containing the Hydrocarbon Nucleus of Dehydroabietic Acid. W. P. Campbell, Newark, assignor to Hercules Powder Co., Wilmington, both in Del.

2,367,001. Amino Dehydroabietic Acid Compound Containing the Hydrocarbon Nucleus of Dehydroabietic Acid. W. P. Campbell, Newark, assignor to Hercules Powder Co., Wilmington, both in Del.

2,367,002. Halogenated Compounds Derived from Dehydroabietic Acid. W. P. Campbell, Newark, Hercules Powder Co., Wilmington, both in Del.

2,367,120. Deproteinizing Rubber Latex by Adding an Alkali Hydroxide and a Stabilizing Fatty Acid, and Heating. J. H. E. Hessels, Klein Soengei-Karang, Galang, Sumatra; vested in the Alien Property Custodian.

2,367,183. Production of Synthetic Resin by Heating a Substantially Olefin-Free Alkylated Aromatic Hydrocarbon Mixture of Alkyl Substituted Monocyclic and Polycyclic Aromatics with Formaldehyde in the Presence of a Condensation Catalyst Consisting of Zinc Chloride Dissolved in Acetic Acid. A. C. Byrns, Palos Verdes Estates, assignor to Union Oil Co. of California, Los Angeles, both in Calif.

2,367,275. Insulating Materials Produced from Discrete Particles of a Low Density Cellular Material, Having a Basis of a Derivative of Cellulose from the Group of Cellulose Esters and Cellulose Ethers, with a Partially Polymerized Phenol-Formaldehyde Resin as Binder. C. I. Haney and M. E. Martin, Cumberland, Md., assignors to Celanese Corp. of America, a corporation of Del.

2,367,296. X-Ray Shield of Resinous Material, Metallic Particles, and Carbon Black. R. P. Lutz, Oak Park, Ill., assignor to Western Electric Co., Inc., New York, N. Y.

2,367,312. Polymerizable Homogeneous Mass Consisting Essentially of Furfuraldehyde and Furfuralcohol. E. A. Reineck, Appleton, Wis., assignor by mesne assignments to Kewaunee Mfg. Co., Adrian, Mich.

2,367,423. Moldable Plastic Composition from a Mixture of (1) an Insoluble Reaction Product of Limited Thermoplasticity Obtained from a Soluble Alkyd Resin, and an Alcohol-Soluble Condensate of Formaldehyde, an Alcohol, and a Member of the Group of Carbamides and Amino-Triazines; (2) an Alcohol Soluble Condensate of Formaldehyde, an Alcohol Liquid at Ordinary Temperatures, and a Member of the Group of Carbamides and Amino-Triazines; and (3) an Organic Solvent-Soluble Alkyd Resin. F. J. Myers, assignor to Resinous Products & Chemical Co., both of Philadelphia, Pa.

2,367,455. Reaction Product of Formaldehyde and an Aminocyanoacetamide. L. H. Bock, Huntington Valley, and A. L. Houk, assignors to Rohm & Haas Co., both of Philadelphia, both in Pa.

2,367,469. Water-Soluble Polyamides from Hex-

amethylenediamine Adipate Condensed with ε-Aminocaproic - Acid - Hydrochloride. P. Moller, Dessau, and H. J. Nicolai, Dessau-Haideburg, both in Germany; vested in the Alien Property Custodian.

2,367,483. **Copolymer of Vinyl Chloride and Vinylidene Chloride Stabilized with Dicyandiamide.** L. E. Cheyney, assignor to Wingfoot Corp., both of Akron, O.

2,367,484. **Cyclohexanonyl and Alkyl Cyclohexanonyl Esters of an Acid from the Group of Acrylic Acid and Alpha Alkyl Acrylic Acids.** A. M. Clifford, Stow, assignor to Wingfoot Corp., Akron, both in O.

2,367,563. **In Treating Glassine Paper to Make It Moisture and Vapor Proof, the Use of a Melt of Paraffin Wax Including Minor Amounts of Polymerized Isobutylene and Unmilled Thermoplastic Rubber Derivative Obtained by Treating Rubber with a Halide of an Amphoteric Metal.** W. H. Bryce, Memphis, Tenn.

2,367,620. **Catalytic Dehydrogenation of Normal Butenes to Produce Butadiene.** W. A. Schulze, J. C. Hillyer, and H. E. Drennan, all of Bartlesville, Okla., assignors to Phillips Petroleum Co., a corporation of Del.

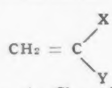
2,367,621. **Dehydrogenation of Butane.** W. A. Schulze and J. C. Hillyer, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., a corporation of Del.

2,367,622. **Butadiene from Normal Butane.** W. A. Schulze, J. C. Hillyer, and H. E. Drennan, all of Bartlesville, Okla., assignors to Phillips Petroleum Co., a corporation of Del.

2,367,623. **Diolefins of 4-5 Carbon Atoms per Molecule from the Corresponding Olefins.** W. A. Schulze, J. C. Hillyer, and H. E. Drennan, all of Bartlesville, Okla., assignors to Phillips Petroleum Co., a corporation of Del.

2,367,629. **Liquid Adhesive Compositions of Butadiene-Acrylonitrile Copolymer Containing as a Toughener a Copolymer of Vinyl Chloride and Vinyl Acetate.** J. Teppema, Cambridge, and J. F. Manning, assignors to B. B. Chemical Co., both of Boston, both in Mass.

2,367,660. **Photopolymerization of a Compound of the Formula**



Where X Is from the Class of Hydrogen, Halogen, and Hydrocarbon, and Y Is from the Class of the Esterified Carboxyl Group, the Carbonamido Group, and the Nitrile Group. C. L. Agre, Minneapolis, Minn., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,367,661. **Photopolymerization of Composition Including Ethylenically Unsaturated, Organic Compound Photopolymerizable at Least in the Presence of Another Such Compound and an Alpha Carbonyl Alcohol of the Formula:**

R — CO — CHOH — R′

Where R and R′ Are Monovalent Hydrocarbon Radicals. C. L. Agre, Minneapolis, Minn., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,367,663. **Insulation Tape Coated with a Composition Including Polymerized Rosin, a Wax-Like Material, and a Plasticizing Agent for the Polymerized Rosin.** J. N. Borglin, assignor to Hercules Powder Co., both of Wilmington, Del.

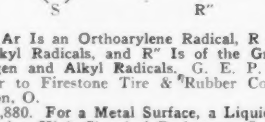
2,367,670. **Cementing Surfaces of Transparent Polymeric Methyl Methacrylate with Fluid, Polymerizable Methyl Methacrylate Containing 0.01 to 1% of Benzoin, and Irradiating.** R. E. Christ, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,367,738. **Light Gray X-Ray Protective Rubber Composition Including Predominantly Pigmentary Lead Titanate.** D. W. Robertson, Montclair, and J. A. Breckley, Mountain Lakes, N. J., assignors to National Lead Co., New York.

2,367,805. **Polymerizing Styrene by Heating in the Presence of a Hydroperoxide.** R. B. Semple, assignor to Monsanto Chemical Co., both of St. Louis, Mo.

2,367,810. **Polymerizing Monomeric Compounds Containing a Styrene Nucleus Having a Single Olefinic Hydrocarbon Side Chain, by Heating the Monomer in the Presence of a Two-Component Catalyst Composition.** V. H. Turkington, Caldwell, and L. R. Whiting, Woodbridge, both in N. J. assignors to Bakelite Corp., New York, N. Y.

2,367,827. **Vulcanizing Rubber in the Presence of a Substance Having the Formula:**



Where Ar Is an Orthoarylene Radical, R and R′ Are Alkyl Radicals, and R″ Is of the Group of Hydrogen and Alkyl Radicals. G. E. P. Smith, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,367,880. **For a Metal Surface, a Liquid Coating Having High Chemical Resistance, Good Adhesion and Toughness, and Consisting of Copolymerized Vinylidene Chloride and Vinyl Chloride, a Solvent for the Copolymer, and Finely Divided Solid, Siliceous Material.** G. Lindh, assignor to Udylite Corp., both of Detroit, Mich.

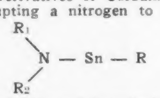
2,367,954. **Chemically Resistant Coating Composition Including an Acetamide of an Aliphatic Hydrocarbon and Ethyl Cellulose.** J. C. Lum, Union, T. J. Keating, Bloomfield, both in N. J., assignors to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

2,368,190. **Sponge Rubber Matrix in Which Is Uniformly Distributed Aluminum Metal Powder.** R. E. Wood, Downers Grove, Ill., assignor by mesne assignments to Van Cleef Bros., Chicago, Ill., a firm consisting of N., F., F. G., R., and J. Van Cleef.

2,368,426. **Resins from Furfuryl Alcohol Heated with Ammonium Thiocyanate.** F. B. Root and C. W. Virgin, both of Montclair, N. J., assignors to Ellis-Foster Co., a corporation of N. J.

2,368,451. **Heat-Hardenable Resinous Composition Obtained by Reacting a Preformed Mono Salt of a Polyaminotriazine with a Partial Reaction Product of Ingredients Including a Polyaminotriazine and Formaldehyde.** G. F. D'Alelio, Pittsfield, Mass., assignor to General Electric Co., a corporation of N. Y.

2,368,515. **Derivatives of Carbamic Acids Prepared by disrupting a nitrogen to sulphur bond**



of an organic sulphide and introducing SC=X between N and S and Treating a Sulphide of the Structure with SC=X, Where R Is an Organic Radical, R_1 and R_2 Are from a Group of Alkyl Groups, Alicyclic Groups, and Groups Joined by a Methylene Chain to Form a Saturated Heterocyclic phur, and n Is an Integer Less Than Three. E. S. Blake, Nitro, W. Va., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,368,521. **N,N-Di-(2-Hydroxyethyl)-Trimethylene Diamine.** A. M. Clifford and J. G. Lichty, Stow, assignors to Wingfoot Corp., Akron, O.

2,368,522. **Composition of Matter Consisting of a Substance from the Group, Natural Rubber, Rubbery Polymers Containing Polymerized Butadiene, and Polychloroprene, and a Modified Hydrocarbon Wax Obtained by Heating the Wax with Lithium Stearate.** M. Cornell, Cleveland, O., and G. H. Meinzer, Glendale, Calif.; Meizner assignor to Cornell.

2,368,538. **Polymerizing a Diisobutenyl Substituted Aryl Compound Which Includes Cooling the Diisobutenyl Aryl Compound below -10° C., and Applying as Catalyst a Solution of Aluminum Chloride in an Alkyl Halide Solvent Having Less Than 5 Carbon Atoms to the Molecule.** A. H. Gleason, Westfield, and W. J. Sparks, Elizabeth, both in N. J., assignors to Standard Oil Development Co., a corporation of Del.

Dominion of Canada

424,701. **Vulcanizing Rubber in the Presence of a Monothiazyl Dithiocarbonate in Which the Thiazyl Radical Is Linked through Sulphur to a Carbonyl Radical, and a Radical from the Group of Alkyl, Aralkyl, Aryl, Alicyclic, and Terpene Radicals Is Linked through Another Sulphur Atom to the Same Carbonyl Group.** Monsanto Chemical Co., St. Louis, Mo., assignee of E. S. Blake, Nitro, W. Va., both in the U. S. A.

424,820. **Molded Article of Ethyl Cellulose.** Carbide & Carbon Chemicals, Ltd., assignee of Bakelite Corp. of Canada, Ltd., both of Toronto, Ont., assignee of A. P. Mazzucchelli, Bloomfield, N. J., U. S. A.

424,821. **Composition Resistant to the Discoloring Effects of Heat, Including an Artificial Thermoplastic Resin, Containing a Vinyl Halide Polymerized therein, Intimately Combined with a Small Amount of a Basic Metal Chelate Derivative of a 1,3-Dicarboxylic Compound Capable of Ketonenol Tautomerism.** Carbide & Carbon Chemicals, Ltd., Toronto, Ont., assignee of W. M. Quattelbaum, Jr., and D. M. Young, both of Charleston, W. Va., U. S. A.

424,834. **Textile Printing Paste Consisting of an Emulsion Including a Heat-Convertible Synthetic Resin.** Interchemical Corp., New York, N. Y., assignee of H. Jenett, Upper Montclair, N. J., both in the U. S. A.

424,921. **Synthetic Resinous Composition.** Canadian General Electric Co., Ltd., Toronto, Ont., assignee of G. F. D'Alelio and J. W. Underwood, both of Pittsfield, Mass., U. S. A.

424,922. **Resinous Product of Reaction of Ingredients Including Urea, Formaldehyde, and Alpha-(Diamino s-Triazinyl Thio Acetamido) Beta-(Chloroacetamido) Ethane.** Canadian General Electric Co., Ltd., Toronto, Ont., assignee of G. F. D'Alelio, Pittsfield, Mass., U. S. A.

424,935. **Structural Material from Pulp Fibers and a Thermoplastic Resin.** Federal Electric Co., Chicago, Ill., assignee of H. W. Richter, Bridgewater, and H. R. Gillette, Newton Highlands, both in Mass., U. S. A.

424,936. **Molding Composition of Lignocellulose and a Plasticizer.** Hercules Powder Co., Wilmington, Del., U. S. A., assignee of J. M. DeBell, Longmeadow, Mass., U. S. A

424,938 **Sole Leather Substitute Consisting of Sheets of Mesh Fabric and Polyvinyl Butyral Resin.** Honorary Advisory Council for Scientific & Industrial Research, assignee of W. Gallay, both of Ottawa, Ont.

425,059. **Resinous Product of Reaction of Ingredients Including Urea, Formaldehyde, and Alpha, Beta-Bis(Diamino s-Triazinyl Hydrazinocarbonyl) Ethane.** Canadian General Electric Co., Ltd., Toronto, Ont., assignee of G. F. D'Alelio and J. W. Underwood, Pittsfield, Mass., U. S. A.

425,084. **Plastic Composition Having over a Wide Range of Temperatures High Tensile Strength, High Dielectric Strength, Resistance to Water, Mineral Acids, Alkalies, Oils, as Well as to Cuts and Abrasions, the Composition Consists of a Conjoint Polymer of a Vinyl Halide with a Vinyl Ester of a Lower Aliphatic Acid, Intimately Combined with a Plasticizer.** Carbide & Carbon Chemicals, Ltd., Toronto, Ont., assignee of S. D. Douglas, Charleston, W. Va.

425,087. **Shaped Article Made from a Sheet Material Having High Tensile Strength, Freedom from Tackiness, Elasticity, Resistance to Oil, Moisture, and Perspiration, and Composed of a Homogeneous Dispersion of a Conjoint Polymer of Vinyl Chloride and Vinyl Acetate, Plasticizer, and Stabilizer.** Carbide & Carbon Chemicals, Ltd., Toronto, Ont., assignee of J. P. Ferrer, South Charleston, W. Va., U. S. A.

425,088. **Injection Molding Composition Consisting of a Conjoint Polymer of a Vinyl Halide and a Vinyl Ester of a Lower Aliphatic Acid, Intimately Combined with a Plasticizer.** Carbide & Carbon Chemicals, Ltd., Toronto, Ont., assignee of W. R. Wheeler, Plainfield, N. J.

425,108. **Water-Soluble Phenolic Resin Adhesive Adapted for Making Boil-Resistant Hot Press Plywood.** I. F. Laucks, Ltd., Vancouver, B. C., assignee of C. F. Van Epps, Lockport, N. Y., U. S. A.

425,130. **Composite Article Including a Body of a Low Temperature Isoolefin-Diolefin Interpolymer Compounded with Carbon Black, Adhered to Natural Rubber.** Standard Oil Development Co., Linden, assignee of F. O. Baldwin, Pluckemin, both in N. J., U. S. A.

United Kingdom

565,489. **Artificial Films, Foils, Filaments, Etc.** H. Dreyfus.

565,566. **Sulphonamide Derivatives of Nitro and Amino Guanidines.** American Cyanamid Co.

565,595. **Networks of Rubber and Products Comprising such Networks.** United States Rubber Co.

565,707. **Coating Composition.** E. I. du Pont de Nemours & Co., Inc. and H. G. Stauffer.

565,955. **Synthetic Resinous Compositions for Molding Bearing or Sealing Members.** Crane Packing Co.

565,974. **Hydrocarbon Interpolymers.** Standard Oil Development Co.

565,981. **Artificial Filaments, Films, Foils, and the Like.** R. W. Moncrieff.

566,003. **Polyvinyl Chloride.** British Thomson-Houston Co., Ltd.

566,004. **Polyvinyl Acetal Resins.** E. I. du Pont de Nemours & Co., Inc.

566,016. **Neoprene Compositions.** E. I. du Pont de Nemours & Co., Inc., and L. S. Bake.

566,048. **Coating Compositions.** E. I. du Pont de Nemours & Co., Inc.

566,058. **Reclaiming Waste Polychloroprenes.** United States Rubber Co.

566,086. **Neoprene Compositions.** E. I. du Pont de Nemours & Co., Inc., and L. S. Bake.

566,068. **Coating Compositions.** E. I. du Pont de Nemours & Co., Inc., and J. W. Clough.

566,091. **Sulphonyl Guanylureas.** American Cyanamid Co.

566,109. **Coating Compositions.** E. I. du Pont de Nemours & Co., Inc., and H. F. Ether.

566,138. **Dispersing Antioxidants.** Wingfoot Corp.

566,144. **Cast Films of Polyvinyl Alcohol.** E. I. du Pont de Nemours & Co., Inc.

566,178. **Coating Surfaces.** E. I. du Pont de Nemours & Co., Inc.

MACHINERY

United States

2,366,308. **Tire Repair Vulcanizer.** T. P. Bacon, Oakland, Calif.

2,366,417. **Apparatus for Continuous Extrusion Molding Including Plastic Ejection Units for Intermittent Injection of Plastic Material.** H. F. MacMillin, Mount Gilead, O., assignor to Hydraulic Development Corp., Inc., Wilmington, Del.

2,366,685. **Tire Buffing and Rebuilding Machine.** P. O. Chambers, assignor to Safety Vulcanizer Co., both of Chicago, Ill.

2,367,144. **Injection Molding Machine.** H. W.

Shaver, assignor to American Insulator Corp., both of New Freedom, Pa.

2,367,204. **Apparatus for Injecting Plastic Compounds.** W. P. Cousino, Detroit, Mich., assignor to Chrysler Corp., Highland Park, Mich.

2,367,243. **Rubber Curring Machine.** J. H. Sweeney, Philadelphia, Pa.

2,367,394. **Extruder.** F. T. Griffiths, Gravesend, Kent, assignor to W. T. Henley's Telegraph Works Co., Ltd., Dorking, Surrey, both in England.

2,367,772. **Tire Building Form.** V. H. Hasselquist, Akron, and W. B. Freeman, Cuyahoga Falls, O., assignors to B. F. Goodrich Co., New York, N. Y.

2,367,821. **Apparatus for Making Fan Belts.** J. B. Davis, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,367,831. **Collapsible Tire-Building Form.** F. J. Manson, Cuyahoga Falls, O., assignor to Firestone Tire & Rubber Co., Akron, O.

2,367,839. **Machine to Buff Rubber-Like Specimens.** F. S. Grover, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,367,841. **Spinning and Cutting Assembly.** H. J. Monroe, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,368,102. **Apparatus for Treating Rubber Material.** J. W. Bowman, Rydal, Pa., assignor to Bowman Gum, Inc., a corporation of Pa.

2,368,172. **Apparatus for Applying a Tread Forming Coating to and Incorporating It with a Tire.** F. H. Taber, New Bedford, Mass.

Dominion of Canada

424,769. **Tire Valve Stitching Apparatus.** Wingfoot Corp., assignee of E. D. George, both of Akron, and M. Lammertse, Cuyahoga Falls, both in O., U. S. A.

424,836. **Device to Apply Liquid to Strip Material.** International Latex Processes, Ltd., London, England, assignee of R. B. Frost, Rutherford, N. J., U. S. A.

424,979. **Apparatus for Producing Tubing.** Sylvania Products Corp., assignee of F. H. Reichel, A. E. Craver, and A. O. Russell, all of Fredericksburg, Va., U. S. A.

United Kingdom

565,592. **Apparatus for Bonding Thermoplastic or Thermosetting Material.** Budd Wheel Co.

565,601. **Extruder for Thermoplastic Material.** Duratube & Wire Co., Ltd., and J. Veit.

565,998. **Press Tools.** British Tire & Rubber Co., Ltd., and S. G. Deaves.

UNCLASSIFIED

United States

2,366,814. **Hose Coupling.** F. E. Smith, South Dartmouth, Mass.

2,367,443. **Forming an End Closure on a Flexible Cigar Container of Rubber Hydrochloride.** J. E. Snyder, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,367,447. **Hose Coupling.** L. F. Strout, assignor to F. A. Bartlett Tree Expert Co., both of Stamford, Conn.

2,367,638. **Tool for Loosening Tires.** W. E. McCulloch, assignor of one-half to K. M. McCulloch, both of Des Moines, Iowa.

2,367,787. **Tire-Clamping Shoe for a Balance-Tester.** J. P. Lannen, Detroit, Mich.

2,367,822. **Mold Construction.** R. W. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,367,832. **Circumferentially Divided Tire Rim.** W. S. Brink, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,367,825. **Split Wheel for Pneumatic Airplane Tires.** W. W. Shaw, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,367,828. **Tire Bead Lock.** W. S. Brink, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,367,829. **Adjustable Seat.** B. H. Shinn, Butler, Pa., assignor to Firestone Tire & Rubber Co., Akron, O.

2,367,837. **Gun Carrier.** H. D. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,367,838. **Tire Tester.** R. W. Allen, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,367,840. **Spark Plug.** M. F. Peters, Beltsville, Md., and J. Ellsworth and D. McCarty, both of Jackson Heights, N. Y.; McCarthy assignor to Firestone Tire & Rubber Co., Akron, O.

2,367,842. **Automatic Mold Cleaning Apparatus.** H. M. Weaver, Cuyahoga Falls, O., assignor to Firestone Tire & Rubber Co., Akron, O.

2,368,227. **Tool for Slitting the Cover of Shielded Wire and Cable Preparatory to Stripping Them.** W. I. Lindall, Saugus, Mass.

2,368,229. **Wheel Cover.** G. A. Lyon, Allenhurst, N. J.

2,368,232. **Automobile Wheel Accessory for Simulating the Appearance of a Low-Pressure and/or White Sidewall Tire.** C. B. Aske, Jr., assignor to Lyon, Inc., both of Detroit, Mich.

2,368,564. **Tire Pressure Gage.** A. Pascoo, New York, N. Y.

Dominion of Canada

424,673. **Single-Wall Metallic Container.** Firestone Tire & Rubber Co., Akron, assignee of M. O. Kuhn, Cuyahoga Falls, both in O., U. S. A.

425,024. **Resilient Wheel.** J. M. MacLean, Vancouver, B. C.

United Kingdom

565,973. **Tire Deflation Indicating Device.** Dunlop Rubber Co., Ltd., W. E. Hardeman, and R. F. Daw.

565,979. **Belt Conveyer to Facilitate Extension.** J. Fitzpatrick.

566,140. **Apparatus to Test the Balance of Rotary Bodies.** Wingfoot Corp.

CALENDAR

Mar. 1.	**First National Products of Tomorrow Exposition. Chicago Coliseum, Chicago, Ill.**
Mar. 1-31.	**American Red Cross War Fund Campaign.**
Mar. 6.	**Los Angeles Rubber Group, Inc. Mayfair Hotel, Los Angeles, Calif.**
Mar. 9.	**Philadelphia Rubber Group. Benjamin Franklin Hotel, Philadelphia, Pa.**
Mar. 9.	**Rubber & Plastics Division, Montreal Section, S. C. I. Ritz-Carlton Hotel, Montreal, P. Q., Canada.**
Mar. 13.	**Ontario Rubber Section. Royal York Hotel, Toronto, Ont., Canada.**
Mar. 23.	**Chicago Rubber Group, Morrison Hotel, Chicago, Ill.**
Apr. 3.	**Los Angeles Rubber Group, Inc. Mayfair Hotel, Los Angeles, Calif.**
Apr. 9-10.	**Midwest Power Conference. Palmer House, Chicago.**
Apr. 9-10.	**Industrial Accident Prevention Associations. Safety Convention. Royal York Hotel, Toronto, Ont., Canada.**
Apr. 13.	**Rubber & Plastics Division, Montreal Section, S. C. I. Ritz-Carlton Hotel, Montreal, P. Q., Canada.**
Apr. 13.	**New York Rubber Group. Building Trades Club, New York, N. Y.**
May 18.	**Chicago Rubber Group. Morrison Hotel, Chicago, Ill.**
May 20-26.	**National Cotton Week.**

Rims Approved and Branded by The Tire & Rim Association, Inc.

Rim Size	Jan.
15" & 16" D.C. Passenger	1945
16x4.00E	83,173
16x4.25E	10,145
16x4.50E	24,874
16x5.00F	3,734
15x5.50F	2,279
16x5.50F	7,504
16x6.00F	5,427
16x6-L	8,240
17" & Over Passenger	
18x2.15B	1,581
Flat Base Truck	
20x4.33R	14,700
15x5.00S	7,069
18x5.00S	888
20x5.00S	390,126
24x5.00S	868
20x5.50S	85,861
15x6.00T	3,340
18x6.00T	4,419
20x6.00T	104,122
22x6.00T	4,757
15x7.33V	212
20x7.33V	76,099
22x7.33V	3,744
24x7.33V	14,943
Semi D.C. Truck	
16x4.50E	2,157
Tractor & Implement	
15x3.00D	6,202
16x3.00D	2,554
19x3.00D	5,735
18x5.50D	5,291
20x5.50F	588
24x6.00S	266
36x6.00S	1,922
24x8.00T	3,598
W8-24	20,392
W8-36	1,604
W8-38	181
W10-28	4,118
W10-38	3,564
W11-26	2
W11-28	487
W11-36	628
DW9-38	16,989
DW10-38	3,605
DW11-26	693
DW11-32	420
DW11-38	3,253
DW12-30	540
Cast	
24x15.00	166
Total	943,060

TRADE MARKS

United States

406,644. Representation of a striped label containing the word: "Parlon." Chlorinated rubber. Hercules Powder Co., Wilmington, Del.

406,733. **Alden House.** Corsets, footwear, etc. Chicago Mail Order Co., Chicago, Ill.

406,761. **Bulldog.** Brake lining. Russell Mfg. Co., Middletown, Conn.

407,115. **Plastigrip.** Paint and shaving brushes. Rubberset Co., Newark, N. J.

407,116. **Plastiset.** Paint and shaving brushes. Rubberset Co., Newark, N. J.

407,124. **Bare-Foot Original.** Footwear. I. N. Joseph, Evanston, Ill.

407,125. **Styleform.** Corsets, garter belts, etc. Style Form Brassiere Co., Inc., New York, N. Y.

407,737. **Jeeps.** Prophylactic rubber articles. C. Goldfine, doing business as V-Brands, New York, N. Y.

407,838. **Priscilla Dean.** Footwear. Garfield & Rosen, Boston, Mass.

407,850. **Pre-fitted.** Electrical parts for automobiles. Kem Mfg. Co., Inc., New York, N. Y.

407,935. **Snow White.** Rubber filler. United States Gypsum Co., Chicago, Ill.

408,024. **Pin-Up Girl.** Dolls. Ideal Novelty & Toy Co., Long Island City, N. Y.

408,057. Representation of a colored banner containing representation of a pole, a prancing horse, and the words: "Rainfair Showerproof." Storm coats. Chicago Rubber Clothing Co., Racine, Wis.

408,083. **Pitchshoulder.** Raincoats, etc. Lamm Bros., Inc., Baltimore, Md.

408,886. **Westfield.** Clothing including corsets and footwear. Rainbow Shops, Inc., Brooklyn, N. Y.

408,892. **Renee Hudnut.** Footwear. R. Schnipper, Brooklyn, N. Y.

408,949. **Tru-Phit.** Footwear. Selby Shoe Co., Portsmouth, O.

408,951. Representation of a seal between the words: "Plasti Sealed." Footwear. Commonwealth Shoe & Leather Co., Whitman, Mass.

408,958. **Plasticote.** Insulated wire. White Electric Co., Inc., Haverstraw, N. Y.

408,961. **Plasticord.** Insulated wire. White Electric Co., Inc., Haverstraw, N. Y.

408,962. **Plasticore.** Insulated wire. White Electric Co., Inc., Haverstraw, N. Y.

408,966. **Lok-Seal.** Merchandise bags of heat-sealable materials. Shellmar Products Co., Mt. Vernon, O.

408,974. **John Crane.** Packings, rubber bellows pump seals, etc. Crane Packing Co., Chicago, Ill.

408,975. **Industrial Synthetics.** Electrical insulation. Industrial Synthetics Corp., Irvington, N. J.

409,120. Representation of a circle containing a triangle and smaller circles containing the words: "Greater Service—W. H. Barber Co.—Minneapolis—Chicago." Tire and tube repair kits. W. H. Barber Co., Minneapolis, Minn.

409,402. Representation of a rectangle containing representations of a spinning wheel and a goat in the clouds and the words: "Tuff-Knit." Raincoats. Harvard Clothing Co., Inc., Boston, Mass.

409,409. **Miss Cambridge.** Raincoats. I. J. Rubin, New York, N. Y.

409,422. **Formfit.** Girdles, etc. Formfit Co., Chicago, Ill.

409,573. **Darex.** Air-entraining agent. Dewey & Almy Chemical Co., Cambridge, Mass.

409,617. **Volafuge.** Brake lining. Raybestos-Manhattan, Inc., Passaic, N. J.

409,766. **Spencer-All.** Corsets, etc. Berger Bros. Co., New Haven, Conn.

409,992. **Liberator.** Brake lining. Grizzly Mfg. Co., Los Angeles, Calif.

FOR REALLY WHITE, SOFT,
HOSPITAL SHEETING
SUN PROCESS OILS....
Eliminate Pigmenting Troubles, Blooming, Excess Shrinkage
To meet the critical standards of hospitals in all parts of the country, a maker of white GR-S rubber sheeting uses Sun Circo light and Circosol 2XH as processing oils. After two years, the company chemist reports:
No discoloration of sheeting, due to pigmentation and a minimum of shrinkage. There has been no blooming, either.
High compatibility with GR-S is a characteristic of Sun oils, and they are neutral in curing, thus eliminating the need for adjustments of sulphur and accelerators.
Proper softness of GR-S stock is produced in the uncured state with full allowance for high resilience in the finished vulcanizate.
To meet the technical requirements of the rubber industry, Sun makes a number of special processing oils and lubricants. In almost all major industrial centers, Sun Engineers, trained in the correct application of these products, are available to consult with you. For further information, call your local Sun Engineer, or write to . . .
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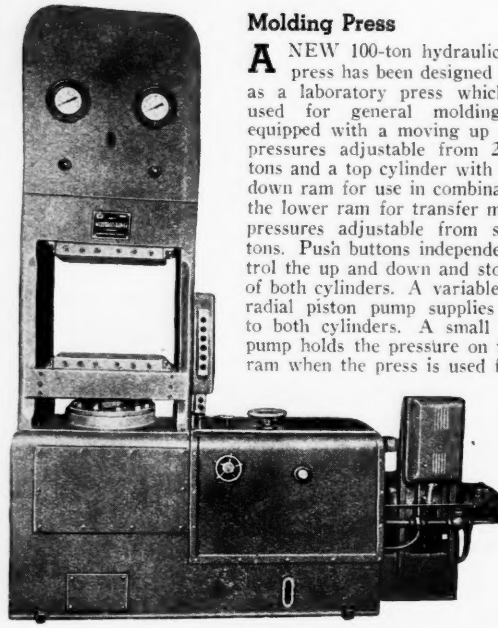
SUNOCO
SUN INDUSTRIAL PRODUCTS
OILS FOR AMERICAN INDUSTRY

New Machines and Appliances



Watson-Stillman Molding Press with Transfer Cylinder

Molding Press

A NEW 100-ton hydraulic molding press has been designed primarily as a laboratory press which can be used for general molding. It is equipped with a moving up ram with pressures adjustable from 25 to 100 tons and a top cylinder with a moving down ram for use in combination with the lower ram for transfer molding at pressures adjustable from six to 30 tons. Push buttons independently control the up and down and stop actions of both cylinders. A variable pressure radial piston pump supplies pressure to both cylinders. A small auxiliary pump holds the pressure on the lower ram when the press is used for transfer molding. Both pumps are driven from a 7½ h.p. 1200 r.p.m. double-end motor. There are separate pressure and inching control hand-wheels for both rams. The operating pressure is 1,950 pounds per square inch. The platen size is 20 inches by 20 inches. The press weighs 8,000 pounds; its height is nine feet and eight inches, and it covers a floor space five feet by 8½ feet. Watson-Stillman Co., Roselle, N. J.

Versatile Infrared Spectrometer

INFRARED spectroscopy, which has achieved an established place in industrial chemistry, offers a direct identification of characteristic atomic groups which previously required a multiplicity of specific chemical reactions. The Perkin-Elmer infrared spectrometer model 12A is designed for both qualitative and quantitative analyses. Its prism materials permit sufficient resolution for research work throughout the spectrum from 1μ to 25μ. The instrument may be manually operated, but provision has been made for automatic drive and synchronized spectral recording if required. A turret stop mechanism permitting rapid

(*Continued on page 736*)

Compact Infrared Spectrometer

New Goods and Specialties

New Resin-Coated "Fabrilite" Raincoat

New Rubber-Like Plastic

"FABRILITE," a new series of plastic coated fabrics made with synthetic resin compositions and used to broaden the utility of woven cotton goods, has been introduced by E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. These materials can be heat sealed and are easily cemented. Designs can be embossed on the surface. 'Fabrilite" is said to be lightweight, unusually tough, easily cut and stitched, resistant to perspiration, stains, moths, food chemicals, abrasion, cracking, stretching, or shrinking, and also to afford high protection against water, cold, wind, and dust.

Although the fabrics are finding their most important application in military uses such as jungle hammocks, mountain tents, life raft sails, and Army raincoats, it is expected that they will eventually be utilized in shower capes, baby pants, hospital sheeting, and raincoats. A preview of one of these "Fabrilite" raincoats is shown.

Synthetic Rubber Gloves

"GOODSEAL" all-purpose gloves of synthetic rubber are said to be highly resistant to mineral, vegetable, and animal oils, petroleum hydrocarbons and solvents, printing inks, photographic solutions, refrigerants, point dryers, alcohols and ethers, plating solutions, hydraulic fluids, and pickling baths. They have reportedly good resistance to acids and alkalies, carbon tetrachlorides, organic acids, and tetraclorethylene. The gloves are made in light, medium, and heavy weights and in 10½-, 12-, 14-, and 18-inch lengths. Goodall Rubber Co., Inc.

EUROPE

GREAT BRITAIN

Limited Production of Civilian Goods Permitted

Last January the Board of Trade permitted the manufacture of a very limited quantity of rubber three-quarter boots for deep-sea fishermen. The new boots will contain a higher percentage of crude rubber than formerly and will be obtainable by any deep-sea fisherman on presentation of the still-necessary buying permit and the required number of coupons or equivalent certificate.

Complaints of the poor quality and high prices of waterproof panties for babies have decided the Board of Trade to license prewar manufacturers of these goods to make a limited quantity of utility garments. The proofing for these panties will be tested by the Cotton Board to ensure that they will meet the required standard.

The Board of Trade has also issued an order releasing surplus stocks of household rubber gloves for sale without permit. The quality of the gloves, it is warned, may vary considerably; but the Rubber Control undertakes to replace to the dealer who bought them any gloves shown to have been defective at the time of the purchase from the Ministry of Supply. The retail ceiling price for the gloves has been fixed at 2s. 10d. a pair, including sales tax.

Postwar Distribution of Rubber

At a symposium of "Postwar Trends in the Rubber Industry" held October 30, 1944, under the auspices of the London Section of the Institution of the Rubber Industry, S. N. Whitehead read a paper on "Marketing of Rubber." One of the questions confronting rubber men is what form postwar distribution of raw rubber will take. Most authorities seem agreed that it will take at least a few years to reestablish a normal flow of rubber from the Far East, for at best the rubber estates will be found overgrown with weeds; most of the plant and equipment for preparing rubber, and hospitals, coolie lines, and other buildings will most probably have been destroyed; while labor will be scarce. At the same time there will be a big demand for rubber.

Under these conditions it is understood that it would probably be necessary for the British Government to continue to be the sole buyer of raw rubber and to control prices and distribution for a short period. But it is essential, Mr. Whitehead emphasized, that government should immediately begin to relax control and to continue to do so gradually until the rubber market is once more free again.

"If the extreme State Planners have their way," he pointed out, "rubber may continue to be completely controlled on a basis of international trade agreements and government-owned buffer pools."

But given the widely different parts of the world in which rubber is grown and consumed, no agreement among major countries alone would insure effective and satisfactory control. Such agreements between governments, moreover, invariably tend to place business dealings on a political footing with consequent risk that dissatisfatcion of any country may create a dangerous situation.

Another consideration is that international control of the distribution of rubber, if successful, would put an end to the markets, and that, of course includes the London Rubber Market, whose members would at best be reduced to the status of mere distributing and forwarding agents since consumers would receive their supplies through the medium of the appropriate government department. That is to say there would be an end to the vast international trade handled by the London market and to the resulting direct and incidental earnings, as well as to the profits derived from freights, insurance, and trading, together with banking and brokers' commissions which reached England in foreign currency.

All this would be the result if international control of distribution of rubber were successful. But if for any reason it were decided not to have international control, and Britain nevertheless continued to adhere to a policy of government bulk buying of rubber, what then would be the result?

After the war Britain will have only about 50% of crude rubber production under her control; synthetic rubber will be there too. Then the British Government would find itself forced to buy

FOR POST-WAR RUBBER PRODUCTS

FULL COLOR

Decorations

AND

Name Plates

THAT

S...T...R..E...T...C..H...

Courtesy of Hood Rubber Co.
Watertown, Mass.

There'll be a lot of changes in rubber footwear through Meyercord Elasti-Cals; many decorative possibilities both in trademark and design—bright, light-hearted colors; smart, dignified trademarks alike in one great value to you—they s-t-r-e-t-c-h. Applied in hot mold or cold, they form an edgeless smooth part of any rubber surface. Make post-war footwear sales sparkle with Meyercord Elasti-Cals. Investigate uses in sporting goods, novelties, sundries and heavier rubber products. Write for full details to Department 57-3.

Buy War Bonds and Keep Them!

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MEYERCORD *Elasti-Cals*

rubber in a world market in competition with other and larger buyers. And, asked Mr. Whitehead, would British factories be happy to find themselves under those circumstances completely dependent on a government buying department "to supply them with the right goods, in the right quantities, and the right grades and quality, at the right time, and at a price competitive with that in other consuming countries where private enterprise is allowed to flourish and buying organizations, therefore, staffed with expert and experienced specialists?"

Considering the risks involved in government control on the one hand and on the other the benefits to the rubber trade of the services of the London market and the contribution to the national income made possible by its activity, the writer concluded that "a free, active, efficient and well-conducted market provides the best and simplest answer to the requirements of the Atlantic Charter without the dangers of international friction . . . Given stable world conditions, free from acute currency exchange fluctuations and violent trade cycles, the Rubber Market can give both the producer and consumer their most pressing need, a reasonably stable price and an even flow of the raw material."

Vulcanized Rubber Crumb for Compounding

In a recent paper on "Vulcanized Rubber Crumb as a Compounding Ingredient"[1], J. R. Scott, points out that until recently crumb was used mainly in articles which did not have to have closely defined physical properties or which did not have to satisfy exacting requirements of specifications. There was consequently no need of detailed knowledge of its effect on physical properties and until the present rubber crisis practically no investigations were made on crumb as a compounding ingredient.

Dr. Scott then describes experiments made with natural tire-tread crumb of various degrees of fineness, in natural rubber, GR-S, Perbunan, neoprene, and "Thiokol" mixes. The effect of crumb on the properties of the unvulcanized stock was not fully examined, but it was observed that plasticity is not much affected by the addition of crumb. In GR-S and Perbunan mixings, however, the crumb reduces elastic recovery after compression—an interesting finding in view of the known difficulties caused by recovery or nerve of synthetics. Again, contrary to expectations, no evidence existed of scorching due to a "two-accelerator effect" produced by residual accelerator in the crumb activating the accelerator in the new stock.

The particle size of the crumb had no significant effect on the mechanical properties of vulcanizates.

A study of the effect of the addition of crumb on tensile strength revealed that with the exception of neoprene, all curves, whether for natural or synthetic base stocks, trend toward about the same point on the tensile strength axis. With neoprene, however, there seems to be less influence of crumb, which, as Dr. Scott emphasizes, is a result that deserves further investigation.

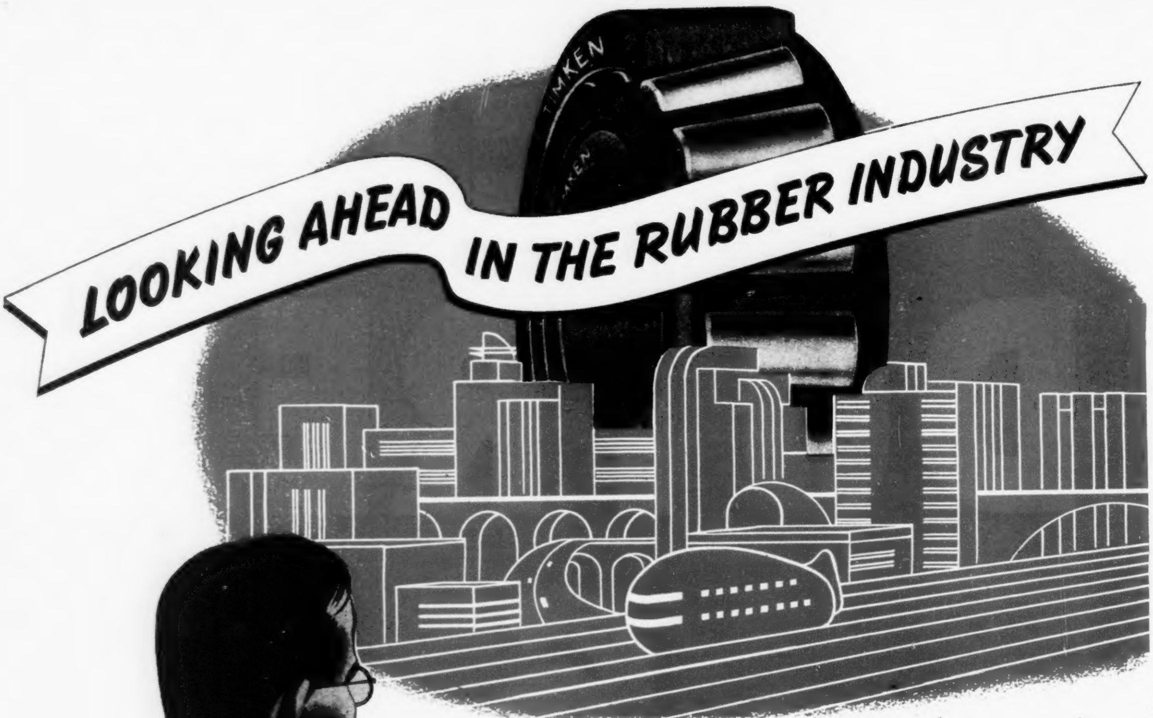
Comparisons of mixes containing crumb, reclaim, and Hibad extender, respectively, showed that in tire tread mixes, crumb is inferior to alkali reclaim, but better than thermal or oil (pan) reclaim, or Hibad extender. In soling mixes, crumb appears to be equal to alkali reclaim; while in mechanical mixes it is better than any of the other materials.

The addition of crumb reduces abrasion resistance except with "Thiokol"; it reduces tear-resistance, except with GR-S tread stocks; it always makes the vulcanizates soft.

Summarizing these observations, Dr. Scott finds that as far as elongation, modulus, hardness, permanent set, and aging are concerned, crumb does not produce any objectionable effects since its softening effect can be corrected by adjusting the filler content, or by other means. The softening effect is explained as probably due to the absorption by the crumbs of some of the sulphur and accelerator in the unvulcanized matrix stock, leading to a deficiency of vulcanizing ingredients in the latter. Tests carried out to determine the cause of the weakening effect of crumb on tensile, abrasion, and tear resistance suggest that the probable explanation is that the bond between crumb and matrix is weaker than the rubber itself so that failure occurs because the matrix tears away from the crumb particles.

In a final set of experiments, mixes of 100 parts of tread crumb (40 mesh) and 10 parts of a softener of the Hibad, Vibad, or bitumen type, but no new rubber, were worked on the mill for about 20 minutes, when a fairly homogeneous mass was obtained; then five parts of sulphur were added. Vulcanizates of these mixes showed surprisingly good properties: tensile, 1,300 to 1,400; tear resistance, 165-225; and permanent set 3.5 to 5.5. By comparison, tensiles of thermal reclaims range from 300 to 1,100 pounds per square inch (average 600 pounds) and from 750 to 1,500 pounds (average 1,100 pounds) for alkali reclaims;

[1] *Trans. Inst. Rubber Ind.*, Aug., 1944, pp. 53-65.


LOOKING AHEAD IN THE RUBBER INDUSTRY
TIMKEN

tensile figures for a mix made from high-grade natural rubber tread stock diluted with an equal amount of tread crumb were only a little better than those of the all-crumb mixes; while tear and abrasion figures were about equal.

Rubber Molds for Metal Figurines

Molds of rubber and rubber-like materials, it is reported, have been found eminently suitable for casting statuettes and small novelties made from tin, white metal, and lead. It is said that the molds can be easily pulled away after use when they immediately regain their original shapes. As many as 300 to 400 castings can be made from a single mold.

Seaweed and Plastics

The great interest being shown in Scotland in seaweed as a material for plastics finally led to the formation a few months ago of the Scottish Seaweed Research Association. The new body is now appointing a research staff and expects to be in full operation shortly.

A. P. Orr, an authority on the subject, recently discussed the commercial possibilities of seaweed, pointing out its potential importance to the plastics industry, artificial silks, transparent paper, and allied industries.

Undoubtedly spurred on by the new Association, the island of Lewis and neighboring islands have been active in organizing the collection of seaweed.

Rubber Men on Honors List

The New Year Honors List includes the names of four men connected with the rubber and allied industries: Arthur Percy Morris Fleming, a director of Metropolitan-Vickers Electrical Co., received a knighthood for services to education; H. G. Durston, lately Controller of Civilian Footwear, was awarded the C.B.E.; Col. D. F. Robinson, formerly in the sales department of the Dunlop Rubber Co., Ltd., and Commander Hingeley, formerly Dunlop general manager in Sweden, were awarded the O.B.E.

Science in Industry

The British Association, through its division for the Social and International Relations of Science, arranged a conference in London on "The Place of Science in Industry" for January 12-13. The program comprised four sessions. The first, with Ernest Bevin as chairman, discussed "What Industry Owes to Science"; the second (chairman, Lord McGowan) was on "Fundamental Research in Relation to Industry"; the third (chairman, Sir J. Greenly) on "Industrial Research and Development"; and the last (chairman, Lord Woolton) on "The Future; What Science Might Accomplish."

SOVIET RUSSIA

A new hard insulating material similar to ebonite is said to have been developed by the Leningrad Physio-Technical Institute from synthetic rubber by what is referred to as "spatial polymerization" induced by heating. The new product, called Escapon, is said to yield satisfactory insulations for high-frequency cables, and it is further claimed that Escapon-insulated cables compare favorably with imported cables.

According to a Soviet report, reconstruction in Lithuania is receiving the necessary attention. Large amounts of raw materials are entering the country, including vast quantities of rubber and synthetic rubber so that the country's basic industries can be started again.

GERMANY

Allied bombing of industrial centers in Germany, by destroying much plant important for the rubber industry, has helped intensify the shortage of tires to such an extent that civilian priorities have in many cases had to be cancelled. All priority card holders were recently ordered to report for further examination. The critical tire situation is also affecting the production of farm products. The increasing needs of the military leave very few tires for field carts and tractors for agricultural purposes, and their manufacture and distribution have therefore had to be curtailed. At the same time, since Germany has been forced to give up so much territory from which it formerly drew a large part of its supplies, the need of intensification of agricultural effort in Germany itself is greater than ever.

AFRICA

Under the stimulus of war requirements, the rubber industry of South Africa has greatly increased both the amount and variety of goods produced. It now produces hose for gasoline, water, oils, and acids, V-belts for automobiles, various kinds of mechanical belting, huge conveyer belts, gaskets, washers, sheeting, aprons, and aircraft dinghies in addition to more than 60 different kinds of tires. Since the outbreak of the war, local companies have made almost 1,000,000 tires for the Army and Air Forces, from small tires with overall diameter of 10 inches for tail wheels of certain aircraft to oversize tires standing more than five feet high for use on road-building and breakdown equipment. About 375,000 of the latter type of tires were produced in addition to more than half a million standard-size tires. There were also tires for motor cycles, tractors, and tank-transportation, bulletproof tires and others, besides about 25,000 airplane tires, for which it had first been necessary to make tire molds.

Infrared Spectrometer

(*Continued from page 726*)

selection of predetermined wave lengths, together with source stability and accurate mechanical controls, makes possible rapid, reproducible measurements.

Rugged, compact construction requires but limited housing space (31 by 11 by 9 inches) and permits easy transportation. The optical parts are enclosed in two air-tight cases. The intermediate space allows easy access to the radiation path for solid, liquid, or vapor (up to 10 centimeters) absorption cells. The housing can be made vacuum tight for small gas concentrations. The instrument is tapped for inlet and outlet tubes to form a 40-centimeter absorption path for static or dynamic sample measurements. The whole spectrometer can serve as an absorption cell of 195-centimeter length in extreme examples, such as flue gas studies. The controls are grouped on a single panel. The Perkin-Elmer Corp.

Editor's Book Table

BOOK REVIEWS

"Annual Report of the Progress of Rubber Technology." Volume VII. 1943. Edited by T. J. Drakeley. Institution of the Rubber Industry, 12 Whitehall, London, S.W.1, England. Paper, 136 pages. Price to non-members 12/6 net; to members, 4/6 net.

The latest edition of this report covers developments for 1943 in all branches of rubber technology, production, and manufacture in a series of short articles by leaders in their respective fields. Extensive references are included at the end of each article. It is of interest to note that the article on synthetic rubber requires the largest number of pages, totaling 21. The next longest article is devoted to compounding ingredients, accelerators, antioxidants, and softeners.

"Dictionary of Engineering and Machine Shop Terms." A. H. Sandy. Chemical Publishing Co., Inc., 234 King St., Brooklyn, N. Y. 1944. Cloth, 8½ by 5½ inches, 156 pages. Price $2.75.

The definitions of many terms used in engineering literature, in machine shops, and in industry are compiled in this small volume. The language is simple and concise. Pronunciation has not been indicated, but most of the words are in common use and easily pronounced. Cross-references are profuse. This is the first American edition of the dictionary which was originally published in England.

NEW PUBLICATIONS

"Data Sheets." Herron Bros. & Meyer, 82 Beaver St., New York, N. Y. 2 pages. The use of Novac as an accelerator and as a vulcanizing agent is presented through physical test data for six GR-S compounds containing from one part to four parts Novac with 100 parts GR-S and one part sulphur or Altax. The second sheet gives two recipes for general-purpose GR-S wire insulation reenforced with Silical. One recipe is extended with Dielex, the other with Dielex Alba. Physical and electrical properties of the cured stocks are given.

"Vinylite Plastics—Bonding." Carbide & Carbon Chemicals Corp., 30 E. 42nd St., New York 17, N. Y. 16 pages. Following a summary of the generally used methods of bonding Vinylite resin compounds, this booklet gives detailed suggestions for standard combinations. The bonding of Vinylite resins to soft rubbers is briefly discussed, and a Buna N multiple coat system suggested. Recipes for Hycar base adhesives and chlorinated rubber emulsion adhesives are given.

"GR-S Compounds of Graduated Hardness." Booklet No. 7. R. T. Vanderbilt Co., Inc., 230 Park Ave., New York 17, N. Y. 8 pages. This report presents test data on Selenac cured compounds, sulphur cured compounds, and sulphur cured compounds containing reclaimed rubber. The Selenac cured compounds proved to have higher tensile strength on the low end of the hardness range and higher elongation throughout the entire range of hardness than the sulphur cured compounds and to have excellent compression set values. The compounds containing reclaim were found to have satisfactory compression set properties, better oven aging properties than the sulphur cured compounds without reclaim, and relatively low tensiles, but relatively good elongations on the high end of the hardness range.

"Taylor Flex-O-Timer." Catalog 98154. Taylor Instrument Cos., P. O. Box 110, Rochester 1, N. Y. 12 pages. Large, clear photographs show the latest applications of the Flex-O-Timer, which precisely times the sequence and duration of operations involving temperature, pressure, and humidity, in curing synthetic rubber tires. This recently revised catalog should be of interest to production men in the rubber industry concerned with increasing output, improving quality, and reducing cost. Also described is a small auxiliary timer for applications which require frequent changes in the duration of one phase of a cycle such as in plastic molding on platen presses.

"Vultac—Sharples Alkyl Phenol Sulfides." Sharples Chemicals, Inc., 123 S. Broad St., Philadelphia 9, Pa. 24 pages. This booklet contains tables and charts showing the physical properties of several vulcanizates of butadiene copolymer rubbers vulcanized with Vultac in contrast to sulphur vulcanized compounds. Featured are compounds with various loadings of EPC and FT blocks and mineral filler, as well as GR-S tread and inner tube stocks. The processing properties and compounding characteristics of the three modifications of Vultac are also discussed.

"A.S.T.M. Standards on Textile Materials (With Related Information)." Prepared by A.S.T.M. Committee D-13 on Textile Materials. Published by the American Society for Testing Materials, 260 S. Broad St., Philadelphia 2, Pa. October, 1944. Paper, 486 pages. Price $2.75. Included in this latest revision of more than 75 standard specifications, tests, and definitions are: Methods and Tolerances for Cotton and Rayon Tire Cord, Woven and on Cones (D179-42); Specifications and Methods for Tire Fabrics, Other Than Cord Fabrics (D122-37); and specifications and methods for duck, Holland cloth, and cotton goods for rubber and pyroxylin coating. The major portion of the book is devoted to standards for evaluating various properties of fabrics.

"Neville Resins and Plasticizers." Neville Co., Neville Island, Pittsburgh 25, Pa. 82 pages. Index. Comprehensive data on coumarone-indene resins and much other new material in the resin and plasticizer field is given in this booklet. Uses in natural and synthetic rubber, protective coatings, plastics, dental compounds, electric insulaiton, chewing gum, adhesives, flooring, and other products are discussed. One chapter presents a preview of new resins, plasticizing oils, solvents, and pure chemicals. Throughout the booklet detailed specifications, proptries, compatibilities, and other characteristics are given, together with requirements for various uses. Figures, charts, and basic formulae define the potentialities of the products described. The use of several Neville resins and plasticizing oils in the compounding of natural rubber, neoprene, GR-S, "Thiokol," and Hycar OR is discussed. Typical recipes are presented together with tables of physical properties of the cured stocks.

"Asbestos Mining Methods." C. V. Smith. 16 pages. **"A Yearbook of Railroad Information."** 1944 Edition. Eastern Railroad Presidents Conference, New York, N. Y. 96 pages. **"Resins and the War"** (Revised). U. S. Industrial Chemicals, Inc., New York, N. Y. 44 pages. **"Polyethylene Resins."** Carbide & Carbon Chemicals Corp., New York, N. Y. 12 pages. **"A High Melting Point, Synthetic Wax—Acrawax C."** Glyco Products Co., Inc., Brooklyn 2, N. Y. 16 pages. **"List of Inspected Gas, Oil, and Miscellaneous Appliances."** December, 1944. Underwriters' Laboratories, Inc., Chicago, Ill. 160 pages. **"Résumé of the Proceedings of the 1944 Convention."** Industrial Accident Prevention Associations, Toronto, Ont., Canada. 132 pages. **"The Ross Laboratory."** J. O. Ross Engineering Corp., New York 17, N. Y. 4 pages. **"Lights Out! Violite . . . On."** R. I. Laboratories, Inc., West Warwick, R. I. 14 pages. **"Glass Tanks by 'Pittsburgh.'"** Pittsburgh Plate Glass Co., Pittsburgh 19, Pa. 4 pages. **"Optonic Color System"** and **"Color Power for Industry."** Arco Co., Cleveland, O. 12 and 28 pages, respectively.

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Market Reviews

COTTON & FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

Futures	Dec. 30	Jan. 27	Feb. 3	Feb. 10	Feb. 17	Feb. 24
July ..	21.70	21.06	21.27	21.26	21.65	21.68
Oct. ..	20.08	20.36	20.62	20.60	21.11	21.13
Dec. ..	20.60	20.28	20.62	20.52	21.04	21.06
Jan. ..	20.58	20.24	20.46	....	20.98	21.01
Mar. ..	20.49	20.12	20.40	21.84	22.08	22.05
May ..	....	20.04	20.30	21.69	22.00	21.98

BETWEEN January 31 and February 10 domestic cotton prices fluctuated. The price was depressed by liquidation. But two factors advanced the price: a great outside demand and Congressional agitation to revise upward the parity formula. The 15/16-inch spot middling price of 22.16¢ on January 31, rose to 22.25¢ on February 5 and dropped again to 22.19¢ on February 10. Then followed a steady rise in price, from 22.30¢ on February 13 to 22.43¢ on February 16. This was due to increased buying and the demand by the CCC for 50,000 bales of cotton for Lend-Lease. Export demand also buoyed up the price of cotton. It closed at 22.47¢ on March 5.

The Census Bureau at Washington reported that in January, 849,945 bales of lint and 128,781 bales of linters were consumed, compared with 760,740 bales of lint and 122,304 of linters in December and 818,724 and 98,887, respectively, during January, 1944. Consumption for the six months ended January 31, 1945, totaled 4,877,181 bales of lint and 743,798 of linters. A year ago, at this corresponding period, the figures were 5,091,116 and 652,171.

Fabrics

Activity in the gray cloth market has been very limited as far as trading is concerned. The already tight market was further burdened by letters received from the Treasury Procurement Division requesting a variety of staple gray cloths, such as print cloths, sheeting, and poplin for first-quarter delivery. The requests totaled several millions of yards and carried an AA-5 rating plus a directive.

Selling houses had a tendency to wait until pending provisions of government orders on distribution control were issued. The two provisions mentioned were M-328B and M-317A. The merchants' outlook was that revisions applicable to the second quarter under M-317A were imminent. The creation of a new set-aside column for Treasury Procurement Division export needs, in addition to the regular export set aside, will be the chief change.

Better priced raincoats are still in demand. The trade, however, cannot get enough cloth to meet the demand buyers requests, but they are doing the best they can.

The United States supply of duck is still insufficient. Trained workers are scarce, and a basic problem is the manpower shortage in the mills. This condition exists despite an increase of cotton duck and substitutes to more than four times the prewar rate, and military requirements are still not being met by 20%. Most serious shortages are in shelter tents and certain numbered ducks. Production will have to be more than doubled during the second quarter to meet military needs, WPB said.

Direction 10 to General Conservation Order M-328, effective February 23, compels producers of spun rayon and similar yarns to convert at least 50% of their facilities to cotton yarn production to increase the output of war-essential yarns and fabrics. The directive also provides for the channeling of the fabrics made from the new cotton yarns into orders for the Army, Navy, Maritime Commission, and War Shipping Administration.

Amendment 2 to CMP No. 5, effective March 1, provides that persons producing cotton duck and duck substitutes, merino yarns and fabrics, combed cotton yarns and fabrics, and wool tops are eligible for the AA-1 preference rating under MRO.

RECLAIMED RUBBER

IN FEBRUARY, demand for reclaimed rubber was considerably higher than in January and probably will continue to be high for the next 60 days, after which time demand will be dependent on war developments. An important factor boosting demand is the current shortage of carbon black. The WPB directive limits use, by rubber manufacturers, to 10,000,000 pounds

(*Continued on page* 746)

COMPOUNDING INGREDIENTS

Current Quotations*

Abrasives

Item	Unit	Price
Fumicestone, powdered	lb.	$0.035 /$0.04
Rottenstone, domestic	lb.	.025 / .03

Accelerators, Inorganic

Item	Unit	Price
Lime, hydrated, *l.c.l.*, New York	ton	25.00
Litharge (commercial)	lb.	.085 / .09
Eagle, sublimed	lb.	.085 / .09
Magnesia, calcined, extra light technical	lb.	.25
Heavy technical	lb.	.05 / .1275
Extra light U. S. P.	lb.	.26
Medium light technical	lb.	.12
Magnesia, light technical	lb.	.25

Accelerators, Organic

Item	Unit	Price
A-10	lb.	.36 / .42
A-19	lb.	.52 / .58
A-32	lb.	.60 / .70
A-77	lb.	.42 / .55
A-100	lb.	.42 / .55
Accelerator No. 8	lb.	.63 / .65
49	lb.	.40 / .42
552	lb.	1.63
808	lb.	.59 / .61
833	lb.	1.13 / 1.15
Acrin	lb.	.65
Advan	lb.	.55
Altax	lb.	.39 / .41
Arazate	lb.	1.53
B-J-F	lb.	.34 / .39
Beutene	lb.	.59 / .64
Butasan	lb.	1.10
Butazate	lb.	1.10
Butyl Eight	lb.	.97 / .99
C-P-B	lb.	1.95
Captax	lb.	.34 / .36
Cumate	lb.	1.60
Cuprax	lb.	.60
D-B-A	lb.	1.95
Delac P.	lb.	.39 / .48
Di-Esterex-N	lb.	.50 / .57
DOTG (Diorthotolylguanidine)	lb.	.44 / .46
DPG (Diphenylguanidine)	lb.	.35 / .41
El-Sixty	lb.	.36 / .43
Ethasan	lb.	1.10
Ethazate	lb.	1.10
Ethylidene Aniline	lb.	.42 / .43
Ethyl Tuads	lb.	1.25
Ethyl Unads	lb.	1.25
Formaniline	lb.	.36 / .37
Guantal	lb.	.39 / .48
Hepteen	lb.	.34 / .39
Base	lb.	1.25 / 1.40
Lead Oleate Witco	lb.	1.75
Ledate	lb.	1.20
MBT	lb.	.34 / .39
MBTS	lb.	.39 / .44
Methasan	lb.	1.20
Methazate	lb.	1.20
Methyl Tuads	lb.	1.25
Monex	lb.	.25
Morfex "33"	lb.	.60 / .65
Novac	lb.	1.40
O-X-A-F	lb.	.38 / .43
Pentex	lb.	.74 / .84
Flour	lb.	.1225/ .1325
Phenex	lb.	.49 / .54
Pipazate	lb.	1.53
Pip-Pip	lb.	1.63
Polyac	lb.	1.25
R & H 50-D	lb.	.42 / .43
R-2 Crystals	lb.	1.55
Rotax	lb.	.44 / .46
Safex	lb.	1.15 / 1.25
Santocure	lb.	.60 / .67
Selenac	lb.	1.60
SPDX-G	lb.	.53 / .58
SRA No. 2	lb.	.53 / .55
Super-Sulphur No. 2	lb.	.13 / .15
Tetrone	lb.	1.25
A	lb.	1.85
Thiofide	lb.	.39 / .46
Thionex	lb.	1.25
Thiotax	lb.	.34 / .41
Thiurad	lb.	1.25
Thiuram E	lb.	1.25
M	lb.	1.25
Trimene	lb.	.54 / .64
Base	lb.	1.03 / 1.18
Triphenylguanidine (TPG)	lb.	.45
Tuex	lb.	1.25
2-MT	lb.	.58 / .60
Ulto	lb.	.99 / 1.04
Ureka	lb.	.50 / .57
Blend B	lb.	.50 / .57
C	lb.	.48 / .55
Vulcanex	lb.	$0.42 /$0.43
Z-B-X	lb.	2.45
Zenite	lb.	.37 / .39
A	lb.	.42 / .44
B	lb.	.39 / .41
Zimate, Butyl	lb.	1.10
Ethyl	lb.	1.10
Methyl	lb.	1.20

Activators

Item	Unit	Price
Activex	lb.	.20 / .22
Aero Ac 50	lb.	.46 / .52
Barak	lb.	.50
MODX	lb.	.295 / .345
SL-20	lb.	.1089/ .1135

Age Resisters

Item	Unit	Price
AgeRite Alba	lb.	1.95 / 2.05
Gel	lb.	.52 / .54
Hipar	lb.	.61 / .63
Powder	lb.	.40 / .42
Resin	lb.	.43 / .45
D	lb.	.40 / .42
White	lb.	1.23 / 1.33
Akroflex C	lb.	.53 / .55
Albasan	lb.	.69 / .74
Aminox	lb.	.40 / .49
Antox	lb.	.54 / .56
Betanox	lb.	.43 / .52
B-L-E	lb.	.40 / .49
Powder	lb.	.61 / .70
B-X-A	lb.	.43 / .52
Copper Inhibitor X-872-A	lb.	1.15
Flectol H	lb.	.40 / .47
Neozone (standard)	lb.	.61 / .63
A	lb.	.40 / .42
C	lb.	.43 / .45
D	lb.	.40 / .42
Distilled	lb.	.45 / .47
E	lb.	.61 / .63
Oxynone	lb.	.77 / .90
Permalux	lb.	1.19 / 1.20
Santoflex B	lb.	.40 / .47
BX	lb.	.54 / .61
Santovar-O	lb.	1.15 / 1.40
Solux	lb.	1.28 / 1.30
Stabilite	lb.	.48 / .50
Alba	lb.	.69 / .74
Thermoflex	lb.	1.18 / 1.20
A	lb.	.61 / .63
C	lb.	.54 / .56
Tysonite	lb.	.165 / .17
V-G-B	lb.	.43 / .52

Alkalies

Item	Unit	Price
Caustic soda, flake, Columbia (400-*lb. drums*)	100 *lbs.*	2.50
Liquid, 50%	100 *lbs.*	1.75
Solid (100-*lb. drums*)	100 *lbs.*	2.10

Antiscorch Materials

Item	Unit	Price
Cumar RH	lb.	.105
E-S-E-N	lb.	.34 / .39
R-17 Resin (*drums*)	lb.	.1075
RM	lb.	1.25
Retarder W	lb.	.36
Retardex	lb.	.445 / .475
U-T-B	lb.	.34 / .39

Antiseptics

Item	Unit	Price
Compound G-4	lb.	.95 / 1.40
G-11	lb.	4.50 / 4.75

Antisun Materials

Item	Unit	Price
Antisol	lb.	.23 / .28
Heliozone	lb.	.23 / .24
S.C.R.	lb.	.32 / .34
Sunproof	lb.	.2275/ .2775

Blowing Agents

Item	Unit	Price
Unicel	lb.	.50

Brake Lining Saturant

Item	Unit	Price
B.R.T. No. 3	lb.	.0175/ .0185

Carbon Black

Conductive Channel—CC

Item	Unit	Price
Conductex A	lb.	.05 / .085
Huber 35-C	lb.	.075
Spheron C	lb.	.0455
I	lb.	.0405
N	lb.	.15
Witco R20	lb.	.0455
R40	lb.	.105 / .14
Voltex	lb.	.105 / .14

Hard Processing Channel—HPC

Item	Unit	Price
Continental F	lb.	.0355†
Huber HX	lb.	.0355†
Kosmobile S/Dixiedensed S	lb.	.0355†
Micronex Mark II	lb.	.0355/ .075
Spheron #4	lb.	.0355†
Witco 6	lb.	.0355†

Medium Processing Channel—MPC

Item	Unit	Price
Arrow	lb.	.0355†
Continental A	lb.	.0355†
Huber TX	lb.	.0355†
Kosmobile 66/Dixiedensed 66	lb.	.0355†
Spheron #6	lb.	.0355†
Standard Micronex	lb.	.0355/ .075
Witco 1	lb.	.0355†

Easy Processing Channel—EPC

Item	Unit	Price
Continental AA	lb.	$0.0355†
Kosmobile 77/Dixiedensed 77	lb.	.0355†
Micronex W-6	lb.	.0355†
Spheron #9	lb.	.0355†
Witco 12	lb.	.0355†
Wyex	lb.	.0355†

Conductive Furnace—CF

Item	Unit	Price
Statex A	lb.	.08 /$0.10
Sterling I	lb.	.09

Fine Furnace—FF

Item	Unit	Price
Statex B	lb.	.07 / .09

High Modulus Furnace—HMF

Item	Unit	Price
Kosmos 40/Dixie 40	lb.	.05 / .075
Modulex	lb.	.05
Philblack A	lb.	.05 / .06
Statex 93	lb.	.05 / .075
Sterling L	lb.	.05

Semi-Reenforcing Furnace—SRF

Item	Unit	Price
Continex	lb.	.035 / .055
Furnex	lb.	.035 / .06
Gastex	lb.	.035 / .06
Kosmos 20/Dixie 20	lb.	.035†
Pelletex	lb.	.035 / .06
Sterling	lb.	.035†
Witco	lb.	.035 / .055

Fine Thermal—FT

Item	Unit	Price
P-33	lb.	.04

Medium Thermal—MT

Item	Unit	Price
Thermax	lb.	.0225

Colors

Black

Item	Unit	Price
Lampblack (commercial), *l.c.l.*	lb.	.12 / .14

Blue

Item	Unit	Price
Du Pont Powders	lb.	2.25 / 3.75
Toners	lb.	.30 / 3.50

Brown

Item	Unit	Price
Mapico	lb.	.1135

Green

Item	Unit	Price
Chrome	lb.	.25
Oxide (*freight allowed*)	lb.	.25
Chromium Hydroxide	lb.	.70
Guignet's (*bbls.*)	lb.	.70
Toners	lb.	.35 / 4.00

Orange

Item	Unit	Price
Du Pont Powders	lb.	2.75 / 3.05
Toners	lb.	.30 / 1.50

Red

Item	Unit	Price
Antimony		
Crimson, 15/17%	lb.	.48
R.M.P. No. 3	lb.	.48
Sulphur free	lb.	.52
7-A	lb.	.37
Z-2	lb.	.25
Du Pont Powders	lb.	.48 / 1.65
Iron Oxide, *l.c.l.*	lb.	.07 / .15
Mapico	lb.	.0885/ .096
Rub Er-Red (*bbls.*)	lb.	.0975
Toners	lb.	.25 / 4.15

White

Item	Unit	Price
Lithopone (*bags*)	lb.	.0425/ .045
Albalith	lb.	.0425/ .045
Eagle	lb.	.0725/ .0750
Titanium Pigments		
Rayox	lb.	.145 / .155
Titanox-A LO and MO	lb.	.145 / .15
C	lb.	.055 / .0575
Zopaque (50-*lb. bags*)	lb.	.145
Zinc Oxide		
Azo ZZZ-11	lb.	.0725/ .075
44	lb.	.0725/ .075
55	lb.	.0725/ .075
66	lb.	.905 / .0975
Eagle, lead free	lb.	.0725/ .0750
French Process, Florence		
Green Seal-8	lb.	.09 / .0925
Red Seal-9	lb.	.085 / .0875
White Seal-7	lb.	.095 / .0975
Kadox, Black Label-15	lb.	.0725/ .075
No. 25	lb.	.085 / .0875
72	lb.	.0725/ .075
Red Label-17	lb.	.0725/ .075
Horse Head XX Special 3	lb.	.0725/ .075
XX Red-4	lb.	.0725/ .075
78	lb.	.0725/ .075
156	lb.	.0725/ .075
166	lb.	.0725/ .075
St. Joe (lead free)		
Black Label	lb.	.0725/ .075
Green Label	lb.	.0725/ .075
Red Label	lb.	.0725/ .075
U.S.P. No. 12	lb.	.105 / .1075
Zinc Sulphide Pigments		
Cryptone ZS No. 800	lb.	.0825 .085

Yellow

Item	Unit	Price
Du Pont Powders	lb.	.70 / 1.75
Mapico	lb.	.0685/ .071
Toners	lb.	.50 / 1.37

Dispersing Agents

Item	Unit	Price
Bardex	lb.	.0425/ .045
Bardol	lb.	.02 / .0275
B	lb.	.05 / .0525
Nevoll (*drums, c.l.*)	lb.	.02 / .025

*Prices in general are f.o.b. works. Range indicates grade or quantity variations. Space limitation prevents listing of all known ingredients. Prices are not guaranteed, and those readers interested should contact suppliers for spot prices.

†Price quoted is f.o.b. works (bags). The price f.o.b. works (bulk) is $0.033 per pound. All prices are carlot.

Extenders

Advagum 1098	lb.	$0.42
1198	lb.	.40
Dielex	lb.	.055 /$0.06
Alba	lb.	.45
Extender 15	lb.	.32
Extendex C	lb.	.15
Gilsonite Selects	ton	30.50
Naftolen R-100	lb.	.10 / .12
Oroplast H	lb.	.1125/ .1175
L	lb.	.0725/ .0825
M	lb.	.0825/ .0925

Fillers, Inert

Asbestos Fiber	ton	15.50 /48.00
Barytes	ton	25.55 /40.00
Off color, domestic	ton	29.00
White, domestic	ton	38.50 /40.00
Blanc fixe, dry, precip.	ton	80.00
Calcene T	ton	37.50 /45.00
Kalite No. 1	ton	26.00
Kalvan	ton	100.00
Magnesium carbonate *l.c.l.*	lb.	.0625/ .075
Pyrax A	ton	7.90
Whiting		
Suprex White (precipitated calcium carbonate)	ton	32.50
Witco, *c.l.*	ton	16.50
Witcarb	ton	32.50
R	ton	100.00
R-12	ton	32.50

Finishes

Mica, *l.c.l.*	lb.	.045 / .055
Rubber lacquer, clear	gal.	1.00 / 2.00
Colored	gal.	2.00 / 3.50
Shoe Varnish	gal.	1.45
Talc	ton	25.00 /35.00

Flock

Cotton flock, dark	lb.	.095 / .112
Dyed	lb.	.45 / .85
White	lb.	.12 / .20
Fabrifil X-24-G	lb.	.095
X-24-W	lb.	.135
Filfloc 6000	lb.	.16
F-40-9000	lb.	.105
Rayon flock, colored	lb.	1.00 / 1.50
White	lb.	.75 / 1.25

Latex Compounding Ingredients

Accelerator 89	lb.	1.20
Advawet	lb.	.46
Aerosol (*drums*)	lb.	.35
Antox, dispersed	lb.	.54
Aquarex BBX Conc.	lb.	.70
Areskap No. 50	lb.	.18 / .24
100, dry	lb.	.39 / .51
Aresket No. 240	lb.	.16 / .22
300, dry	lb.	.42 / .50
Aresklene No. 375	lb.	.35 / .50
400, dry	lb.	.51 / .65
Black No. 25, dispersed	lb.	.22 / .40
Casein	lb.	.24 / .2475
Collocarb (Dispersed Wyex)	lb.	.06 / .07
Copper Inhibitor X-872	lb.	2.25
Darvan No. 1	lb.	.30 / .34
2	lb.	.30 / .34
Dispersex No. 15	lb.	.11 / .12
20	lb.	.08 / .10
Factex Dispersion A	lb.	.185
Marmix	gal.	1.75 / 2.00
Micronex, Colloidal	lb.	.06 / .07
Nevilloid C-55	lb.	.12
Resin V	lb.	.13
Santomerse D	lb.	.41 / .65
S	lb.	.11 / .25
Sodium Stearate	lb.	.40
Stablex A	lb.	.90 / 1.10
B	lb.	.70 / .90
C	lb.	.40 / .50
Sulphur, dispersed No. 2	lb.	.08 / .12
Tepidone	lb.	.63
Tysonite, dispersed	lb.	.32 / .35
Zinc oxide, dispersed	lb.	.12 / .15

Mineral Rubber

Black Diamond, *l.c.l.*	ton	25.00 /30.00
B.R.C. No. 20	lb.	.0105/ .0115
Hydrocarbon, Hard	ton	25.00 /27.00
Lode	lb.	.04 / .045
MilliMar	lb.	.055
Parmr	ton	21.00 /29.00
Pioneer, *c.l.*	lb.	25.00 /30.00
Witco MR solid	ton	25.00
Granular	ton	30.00

Mold Lubricants

Aluminum Stearate	lb.	.23 / .24
Aquarex D	lb.	.60
MDL Paste	lb.	.25
Colite	gal.	.90 / 1.15
Dipex	lb.	.1275/ .15
Lubrex	lb.	.25 / .30
Rubber-Glo, conc. regular	gal.	.94 / 1.15
Type W	gal.	.99 / 1.20
Sericite	ton	65.00
Soapstone, *l.c.l.*	ton	15.00 /35.00
Zinc stearate	lb.	.30 / .31

Reclaiming Oils

B.R.V.	lb.	.03 / .0375
C-10	gal.	.19 / .24
D-4	gal.	.17 / .22
E-5	gal.	.15 / .20
No. 1621	lb.	$0.016 /$0.0235
S.R.O.	lb.	.015 / .0225
X-60 (reclaiming)	gal.	.20 / .28
X-443	gal.	.20 / .27

Reenforcers, Other Than Carbon Black

Buca	ton	40.00
Carbonex Flakes	lb.	.03 / .035
S	lb.	.031 / .036
Plastic	lb.	.031 / .0335
Clays		
Aerfloted Hi-White	ton	10.00
Paragon	ton	10.00
Suprex	ton	11.00 /23.50
Catalpo, *c.l.*	ton	30.00
Champion	ton	11.00 /23.50
China	ton	25.00
Crown	ton	11.00 /23.00
Dixie	ton	11.00
Hydratex R	ton	20.00
"L"	ton	10.00
Langford	ton	9.50 /20.00
Magnolia	ton	10.00
McNamee	ton	10.00
#33	ton	30.00
Par	ton	11.00
Paraforce, *c.l.*	ton	50.00
Witco, *c.l.*	ton	25.00
Cumar EX	lb.	.0525
MH	lb.	.065 / .1175
V	lb.	.0975/ .1275
465 Resin	lb.	.035
"G" Resin	lb.	.08
Nevindene	lb.	.105 / .135
Resinex	lb.	.0275/ .0325
Silene "EF"	lb.	.055 / .06
Silical	ton	65.00 /85.00

Reodorants

Coumarin	lb.	2.75 / 3.25
Curodex 19	lb.	4.75
188	lb.	5.75
198	lb.	6.75
Para-Dors (ABCDE)	lb.	.25 / 4.00
Rodo No. 0	lb.	4.00 / 4.50
10	lb.	5.00 / 5.50
Vanillin	lb.	2.25 / 2.95

Rubber Substitutes

Black	lb.	.09 / .15
Brown	lb.	.105 / .1875
White	lb.	.0975/ .165
Factice		
Amberex Type B	lb.	.20
Brown	lb.	.095 / .19
Neophax A	lb.	.165
B	lb.	.165
White	lb.	.10 / .20

Softeners and Plasticizers

Abalyn	lb.	.0722/ .0947
Ambidex	lb.	.23
"S"	lb.	.23
B.R.T. No. 7	lb.	.02 / .021
Belro Resin	100 lb.	2.71 / 3.00
Bondogen	lb.	.98 / 1.05
Bunnatol G	lb.	.40 / .50
S	lb.	.40 / .50
Butac	lb.	.085 / .105
Butyl Roleate	lb.	.16 / .195
Capryl Alcohol	lb.	.16 / .195
Circosol-2XH Elasticator for GR-S	gal.	
Dibenzyl Sebacate	lb.	.67 / .74
Phthalate	lb.	.51 / .59
Dibutyl Sebacate	lb.	.46 / .565
Dicapryl Phthalate	lb.	.25 / .30
Dipentene	gal.	.56 / .58
Dipolymer Oil	gal.	.33 / .38
Dispersing Oil No. 10	lb.	.0375/ .04
Duraplex C-50 LV, 100%	lb.	.25 / .295
Dufrex 6	lb.	.25 / .375
Hercolyn	lb.	.1122/ .1347
JMH	lb.	.65 / .67
Marbon S	lb.	.65 / .75
S-1	lb.	.65 / .75
Myristilene	lb.	.20 / .30
Nevinol	lb.	.13
No. 1-D Heavy Oil	lb.	.04
Nuba resinous pitch (*drums*)		
Grades No. 1 and No. 2	lb.	.029
3-X	lb.	.0425
Palmalene	lb.	.15
Para Flux (reg.)	gal.	.17 / .18
No. 2016	gal.	.135 / .19
Para Lube	lb.	.046 / .048
Paradene No. 1 (*drums*)	lb.	.0525
No. 2	lb.	.0525
Special (*drums*)		
20 to 35° C. M.P.	lb.	.0265
35 to 45° C. M.P.	lb.	.0625
45 to 75° C. M.P.	lb.	.0575
Paraplex AL-111	lb.	.21 / .25
G-25, 100%	lb.	.75
Phthalate	lb.	.51 / .59
Paroils	lb.	.0975/ .18
Picco-100	lb.	.09
Piccocizer "30"	lb.	.055 / .06
Piccolastic A-5	lb.	.24 / .245
Piccolyte Resins	lb.	.15 / .185
Piccoumaron Resins	lb.	.045 / .15
Piccovol	lb.	.20 / .25
Pictar	gal.	.18 / .23
Oil	gal.	.45
Plasticizer B	lb.	$0.35 /$0.45
35	lb.	.205 / .24
36	lb.	.305 / .34
Plastoflex No. 10	lb.	.20
No. 20	lb.	.25
Plastogen	lb.	.0775/ .08
Plastone	lb.	.27 / .30
Poly-pale Resin	lb.	.06 / .07
R-19 Resin (drums)	lb.	.1075
21 Resin (*drums*)	lb.	.1075
Reogen	lb.	.115 / .12
Resin R6-3	lb.	.38 / .40
Rio Resin	lb.	.36 / .38
RPA No. 1E	lb.	.55
2	lb.	.65
3	lb.	.46
4	lb.	.80
5	lb.	.57
Santicizer B-16	lb.	.32 / .36
E-15	lb.	.34 / .38
M-17	lb.	.355 / .39
Sebacic Acid	lb.	.48 / .55
Solvenol	gal.	.56 / .58
Staybelite	lb.	.06 / .065
Syntac	lb.	.275 / .35
TR-11	lb.	.035
Tarzac	lb.	.23 / .24
Tricresyl Phosphate	lb.	.24 / .245
Turgum "S"	lb.	.0675
Vinsol Resin	lb.	.025 / .035
Vistac No. 1	lb.	.20 / .214
No. 2	lb.	.214 / .227
Witco No. 20, *l.c.l.*	gal.	.175
X-1 resinous oil (*tank car*)	lb.	.011 / .016
XX-100 Resin	lb.	.0525

Softeners for Hard Rubber Compounding

Resin C Pitch 45°C. M.P.	lb.	.01 / .016
60°C. M.P.	lb.	.01 / .016
75°C. M.P.	lb.	.01 / .016

Solvents

Carbon Bisulphide	100 lbs.	5.00 / 5.75†
Tetrachloride	gal.	.73 / .94†
Cosol No. 1	gal.	.26 / .34
No. 2	gal.	.25 / .33
No. 3	gal.	.22 / .30
GVL	lb.	1.00
Industrial 90% benzol (*tank car*)	gal.	.15 / .22
Nevsol	gal.	.245 / .31
Picco	gal.	.22 / .32
Skellysolve	gal.	.071 / .105
Tollac	gal.	.28 / .33

Stabilizers for Cure

Barium Stearate	lb.	.29 / .32
Calcium Stearate	lb.	.26 / .27
Laurex (*bags*)	lb.	.1475/ .1725
Magnesium Stearate	lb.	.31 / .32
Stearex, single pressed	lb.	14⅞/ .15⅞
double pressed	lb.	15¾/ .16¾
Beads	lb.	.14¾/ .15¾
Stearic acid, single pressed	lb.	.15¾/ .16¾
Stearite, *c.l.*	lb.	.14375
Zinc Laurate	lb.	.29 / .32
Stearate	lb.	.30 / .31

Synthetic Rubber

Butaprene NF	lb.	.45 / .60
NL	lb.	.48 / .63
NXM	lb.	.50 / .65
Chemigum N-1	lb.	.53 / .60
Hycar OR-15	lb.	.50 / .65
OR-25	lb.	.45 / .60
OS-10	lb.	.45 / .60
Neoprene Latex Type (dry weight)		
60	lb.	.43 / .44
571	lb.	.36 / .40
Concentrated	lb.	.41 / .42
572	lb.	.45 / .46
Neoprene Type CG	lb.	.50
E	lb.	.65
FR-S	lb.	.65
GN-A	lb.	.28
KNR	lb.	.75
Paraplex X-100	lb.	1.00
Perbunan 26	lb.	.48
Synthetic 100	lb.	.41

Tackifiers

B.R.H. No. 2	lb.	.015
Piccolastic A-25	lb.	.24 / .245
Plastic	lb.	.12
Ty-Ply Q	gal.	6.75 / 8.00
A	gal.	6.75 / 8.00
S	gal.	6.75 / 8.00
A	gal.	6.75 / 8.00

Vulcanizing Ingredients

Magnesia, light (for neoprene)	lb.	.25
Sulphur	100 lbs.	2.05
Insoluble, 60	lb.	.16
Rubbermaker's commercial	100 lbs.	2.05†
Refined	100 lbs.	2.40†
Telloy	lb.	1.75
Tonox	lb.	.50 / .59
Vandex	lb.	1.75
Vultac 1	lb.	.38 / .45
2	lb.	.38 / .45
3	lb.	.42 / .49

Waxes

Antisol	*lb.*	$0.225	/$0.275
Carnauba, No. 3 chalky	*lb.*	.7125	
2 N.C.	*lb.*	.7675	
3 N.C.	*lb.*	.735 /	.745
1 Yellow	*lb.*	.8325	
2	*lb.*	.8125	
Carnube	*lb.*	.49 /	.59
Monten	*lb.*	.12 /	.17
Rubber Wax No. 118			
Colors	*gal.*	.86 /	1.41
Neutral	*gal.*	.76 /	1.31

Reclaimed Rubber

(Continued from Page 740)

of carbon black per month, and, as a result, reclaimed rubber is being sought for the carbon black content in it.

WPB Rubber Bureau on February 27 ordered reclaimed rubber output raised from the present monthly rate of 19,000 tons to 25,000 tons to meet heavy truck and bus tire needs.

Reclaimed Rubber Prices

	Sp. Grav.	¢ per Lb.
Auto Tire		
Black Select	1.16-1.18	7 / 7¼
Acid	1.18-1.22	8 / 8¼
Shoe		
Standard	1.56-1.60	7½/ 7¾
Tubes		
Black	1.19-1.28	11¾/12
Gray	1.15-1.26	12½/13½
Red	1.15-1.32	12½/13
Miscellaneous		
Mechanical blends	1.25-1.50	5 / 6

The above list includes those items or classes only that determine the price bases of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

SCRAP RUBBER

THE rubber scrap supply in February gave no definite signs of changing from the January situation, at which time the supply was far outweighed by the demand. Scrap dealers are being offered more and more mixed scrap containing both synthetic and natural stocks. Although it has become increasingly difficult to maintain a system whereby natural and synthetic scrap stocks could be graded and sorted, progress is being made.

All grades of scrap rubber are being sold at ceiling prices.

Scrap Rubber Ceilings

Inner Tubes†	¢ per Lb.
Red passenger tubes	7½
Black passenger tubes	6¾
Truck tubes	6½
Tires‡	$ per Short Ton
Mixed passenger tires	20.00
Beadless passenger tires	26.00
Mixed truck tires	20.00
Solid tires	36.00
Peelings†	
No. 1 peelings	52.25
2 peelings	33.00
No. 1 light colored (zinc) carcass	57.75
Miscellaneous Items*	
Air brake hose	25.00
Miscellaneous hose	17.00
Rubber boots and shoes	33.00
Black mechanical scrap above 115 sp. gr.	20.00
General household and industrial scrap	15.00

† All consuming centers except Los Angeles.
‡ Akron only.
* All consuming centers.

Fixed Government Prices*

	Price per Pound: Civilian Use	Price per Pound: Other Than Civilian Use
Balata		
Manaos Block	$0.38¾	$0.38¾
Swinam Sheet	.42½	.42½
Guayule		
Guayule (*carload lots*)	.17½	.31
Latex		
Normal (*tank car lots*)	.26	.43½
Creamed (*tank car lots*)	.26¾	.44¼
Centrifuged (*tank car lots*)	.27¾	.45¼
Heat-Concentrated (*carload drums*)	.29½	.47
Plantation Grades		
No. 1X Ribbed Smoked Sheets	.22½	.40
1X Thin Pale Latex Crepe	.22½	.40
2 Thick Pale Latex Crepe	.22	.39½
1X Brown Crepe	.21⅜	.38⅞
2X Brown Crepe	.21⅛	.38⅝
2 Remilled Blankets (Amber)	.21¼	.38¾
3 Remilled Blankets (Amber)	.21⅛	.38⅝
Rolled Brown	.18	.35½
Synthetic Rubber		
GR-M (Neoprene GN)	.27½	.45
GR-S (Buna S)	.18½	.36
GR-I (Butyl)	.15½	.33
Wild Rubber		
Upriver Coarse (crude)	.12⅝	.26⅛
(washed and dried)	.20¼	.37¾
Islands Fine (crude)	.14⅝	.28¼
(washed and dried)	.22½	.40
Caucho Ball (crude)	11⅝	.29¾
(washed and dried)	.19½	.37
Mangabiera (crude)	.08½	.19¾
(washed and dried)	.18	.35½

* For a complete list of all grades of all rubbers, including crude, balata, guayule, synthetic, and latex, see Rubber Reserve Co. Circular 17, p. 169, May, 1943, issue.

CLASSIFIED ADVERTISEMENTS

ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE

GENERAL RATES	SITUATIONS WANTED RATES	SITUATIONS OPEN RATES
Light face type $1.00 per line (ten words)	Light face type 40c per line (ten words)	Light face type 75c per line (ten words)
Bold face type $1.25 per line (eight words)	Bold face type 55c per line (eight words)	Bold face type $1.00 per line (eight words)
Allow nine words for keyed address.	**Address All Replies to New York Office at 386 Fourth Avenue, New York 16, N. Y.**	*Replies forwarded without charge*

SITUATIONS OPEN

WILL YOUR SALES SHRINK 50% WHEN GERMANY QUITS?

DIAMOND JOINTS, swing and revolving, are selling to war plants making tires and molded goods. Your sales will increase after the war. Some choice territory open. Write

DIAMOND Metal Products Company
406 Market St., St. Louis 2, Mo.

WANTED: RUBBER COMPOUNDER AND ENGINEER, PREFERABLY on hose or belts by Rubber Manufacturer located in Eastern Pennsylvania. Essential job at present, with excellent postwar future. Please give full details as to experience, qualifications, salary desired, etc., in first letter. Statement of Availability necessary. Address Box No. 53, care of INDIA RUBBER WORLD.

EXCELLENT OPPORTUNITY FOR RUBBER TECHNOLOGIST IN an expanding western firm producing tire materials and mechanical rubber goods. Should hold a degree in either Chemistry or Engineering and have at least three years of experience in rubber compounding and two years of experience in factory processing of rubber compounds. Bright future with chance for advancement. Address Box No. 55, care of INDIA RUBBER WORLD.

CHIEF PLANT CHEMIST—Chemical Engineer or Graduate Chemist. Experience in controlling the technical aspects of the operations of a Chemical Plant engaged in the manufacturing of emulsions or solvent preparations.

ASSISTANT CHIEF CHEMIST—Chemical Engineer or Graduate Chemist. Experience in supervising and controlling some important aspects of the operations of a Chemical Plant. Good background in manufacturing of emulsions or solvent preparations desirable. Capable of devising new tests for evaluating new properties of specialized products.

CONTROL CHEMISTS (2)—Chemical Engineer or Graduate Chemist. Experience in control work in Chemical Plant, preferably one engaged in manufacturing of emulsions or solvent preparations.

RUBBER CHEMIST—Experience in rubber and rubber compounding, including synthetics.

Company has excellent postwar future—wonderful opportunities for right men. Location—Metropolitan New York area. Send complete résumés including draft status to Box No. 56, care of INDIA RUBBER WORLD.

WANTED: A MAN WITH GOOD EDUCATION AND SOME TECHNICAL rubber experience to assist in the preparation of technical booklets of an advertising nature on rubber compounding. Address Box No. 57, care of INDIA RUBBER WORLD.

TIRE CURING FOREMAN—Good opportunity for experienced foreman capable of supervising production in pot heaters and individual vulcanizers. Offers attractive postwar as well as present-day opportunity. Eastern concern. Address Box No. 58, care of INDIA RUBBER WORLD.

TIRE FINISHING SUPERVISOR—Must have experience in supervising all duties connected with cured tire final finishing. Excellent opportunity for advancement with postwar security. Located in Pennsylvania. Address Box No. 59, care of INDIA RUBBER WORLD.

TUBE ROOM SUPERINTENDENT—Must have thorough knowledge of all phases of inner tube manufacture. Opening offers excellent opportunity to man with initiative and ability. Plant located in Pennsylvania. State all qualifications first letter. Address Box No. 60, care of INDIA RUBBER WORLD.

CHEMIST—FAST GROWING, ESTABLISHED HOUSEHOLD products manufacturer in Middle West needs technical man. Some experience in rubber cements preferred. 85% war work now, but can convert overnight. Permanent. Write fully, stating experience and salary expected. Address Box No. 61, care of INDIA RUBBER WORLD.

SITUATIONS OPEN (Continued)

SPREADING ROOM FOREMAN

with experience in general proofing.

Suburban Boston Area. Permanent postwar position. Must be able to furnish Certificate of Availability.

ADDRESS BOX NO. 910, Care of INDIA RUBBER WORLD.

CHEMICAL ENGINEER—COLLEGE GRADUATE PREFERRED—for position in compounding section of progressive manufacturer, producing tires and tubes. Previous experience desirable, but not required. Plant located in Mid-Atlantic area. Complete history of qualifications should be included in letter of application. Address Box No. 62, care of INDIA RUBBER WORLD.

MAN WITH SOME EXPERIENCE IN RUBBER COMPOUNDING for position with small but well-established synthetic resin manufacturer in Chicago area. Will work on customers' technical problems. Position will lead to technical sales and service work for qualified man. Starting salary $3,000 to $3,300, depending on qualifications. Send full information including education, experience, and recent photograph. Address Box No. 63, care of INDIA RUBBER WORLD.

WANTED: MAINTENANCE ENGINEER IN AN Eastern mechanical rubber goods plant. Give experience and state salary expected. Address Box No. 67, care of INDIA RUBBER WORLD.

WANTED: FOREMAN FOR INFLATABLE GOODS department. Man familiar with manufacture life rafts, life jackets, and hand-made goods preferred. State previous experience. Address Box No. 68, care of INDIA RUBBER WORLD.

COATING CHEMISTS

Research laboratory. Essential war work. New York City. Should be a graduate in chemistry or chemical engineering with some experience in compounding of resins and synthetic rubbers for textile coatings, adhesives, or allied fields. These are permanent and postwar positions. Please send outline of training and experience. Address Box No. 69, care of INDIA RUBBER WORLD.

RUBBER CHEMIST AND COMPOUNDER, EXPERIENCED IN processing and supervising, to take complete charge of well-equipped laboratory and responsibility for manufacturing specifications and technique in all phases of production. General line of molded, tubed, wrapped, and punched mechanical goods of rubber and synthetics, including hard rubber. Small progressive company. Excellent postwar opportunity. Give qualifications and detailed information. Will be held confidential. Statement of availability is necessary. Address Box No. 71, care of INDIA RUBBER WORLD.

RUBBER CHEMIST AS ASSISTANT FOR ROUTINE WORK IN laboratory under direction of experienced Chief Chemist. General-line molded, tubed, wrapped, and punched mechanical goods of rubber and synthetics. Small progressive company. Excellent postwar opportunity. Give qualifications and detailed information. Will be held confidential. Statement of availability is necessary. Address Box No. 72, care of INDIA RUBBER WORLD.

PRODUCTION ANALYST AND MANAGER EXPERIENCED IN all phases of production to take complete charge of installation of production and follow-up system with company in general line of molded, tubed, wrapped, and punched mechanical rubber goods. Excellent postwar opportunity. Give qualifications and detailed information. Will be held confidential. Statement of availability is necessary. Address Box No. 73, care of INDIA RUBBER WORLD.

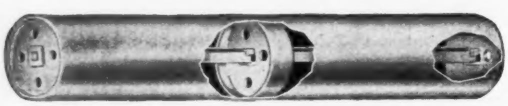
RESEARCH CHEMIST WITH EXPERIENCE IN MECHANICAL and molded goods, wanted by progressive manufacturer located in New York area. All replies treated with strict confidence. Give full background and advise salary expected. Address Box No. 77, care of INDIA RUBBER WORLD.

(Classified Advertisements Continued on Page 750)

MACHINERY AND SUPPLIES FOR SALE

MACHINERY AND SUPPLIES WANTED

(Classified Advertisements Continued on Page 752)



SITUATIONS WANTED

SALES EXECUTIVE—10 YEARS' EXPERIENCE IN sales of mechanical rubber goods; good background sales engineering, product development, hose and belting. Familiar government specification material, Rubber Order R-1, and R.M.A. Sales Meetings, capable of handling jobber and consumer accounts or administrative sales policy. Age 36. $8,000 minimum. Address Box No. 64, care of INDIA RUBBER WORLD.

FACTORY SUPERINTENDENT WITH A BACKGROUND OF 25 years' experience in the rubber industry desires connection with small- or medium-sized plant. Capable of organizing, efficiently handling help, compounding, processing, and development work on molded and extruded mechanical and specialty products from natural and synthetic rubbers, also plastics. Have a thorough knowledge of rubber costing and trade contacts. Prefer Eastern location. Address Box No. 65, care of INDIA RUBBER WORLD.

RUBBER CHEMIST AND COMPOUNDER, 17 YEARS' experience in compounding and processing mechanical goods, rubber-to-metal bonding. 10 years' experience in all types of synthetic rubber. Desire more essential war work in Midwest. Married; 2-B. Address Box No. 74, care of INDIA RUBBER WORLD.

SUPERINTENDENT WITH 25 YEARS' EXPERIENCE IN MANUfacture of mechanicals, solid and sponge, from reclaim, natural, and synthetic rubbers, desires new connections. Capable compounder and development engineer. Can estimate costs and provide manufacturing specifications. Have been employed by large and small concerns. Address Box No. 75, care of INDIA RUBBER WORLD.

MISCELLANEOUS

WANTED: MILLING FACILITIES—(Long Is., B'klyn, or N.Y.C. area). If you are milling rubber for your own production and have spare time, we will pay you to mill for us. We require about 50 hours per month, cold milling. Address Box No. 54, care of INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES

WANTED: MILLING AND/OR PRESSING, LARGE OR SMALL capacity or will purchase plant with facilities for all or any part of above. Preferably Midwest or will consider East or West. Address Box No. 76, care of INDIA RUBBER WORLD.

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